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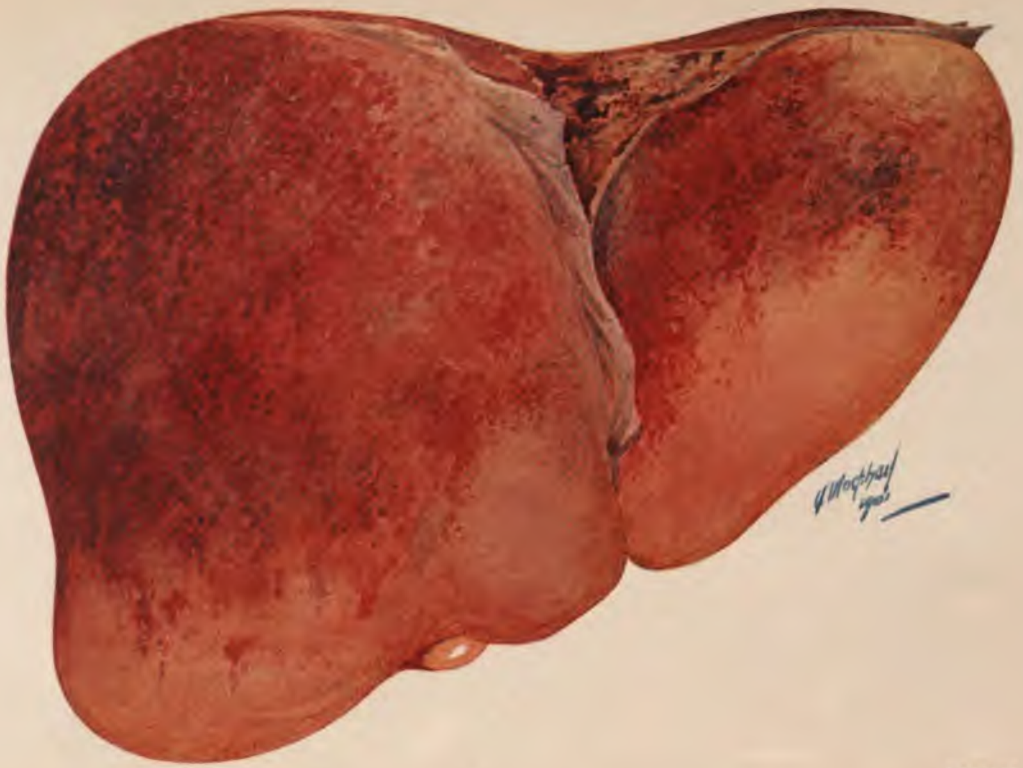

REPRODUCTION OF A
WATER COLOUR DRAWING OF LIVER FROM A CASE OF ECLAMPSIA

CLINICAL OBSTETRICS

BY

ROBERT JARDINE

M.D. [illegible] P. & S. GLAS., F.R.S. [illegible]

[illegible] PROFESSOR OF [illegible] GLASGOW; SENIOR [illegible] TO THE [illegible]
[illegible] THE [illegible]
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CLINICAL OBSTETRICS

BY

ROBERT JARDINE

M.D. Edin., M.R.C.S. Eng., F.F.P. & S. Glas., F.R.S. Edin.
PROFESSOR OF MIDWIFERY IN ST. MUNGO'S COLLEGE, GLASGOW; SENIOR PHYSICIAN TO THE GLASGOW MATERNITY HOSPITAL; EXAMINER IN MIDWIFERY TO THE SCOTCH CONJOINT BOARD; FORMERLY EXAMINER IN MIDWIFERY TO THE UNIVERSITY OF GLASGOW; LATE PRESIDENT OF THE GLASGOW OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY, ETC., ETC.

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TO THOSE OBSTETRICIANS WHO ARE ENDEAVOURING, BY ASEPTIC METHODS, TO DO FOR MIDWIFERY WHAT HAS ALREADY BEEN DONE FOR SURGERY, THIS BOOK IS RESPECTFULLY DEDICATED BY

THE AUTHOR.

32860

PREFACE TO THE SECOND EDITION

THE favourable reception which the first edition has met with emboldens me to issue a second one, which I venture to hope may be found an improvement. I have added a considerable number of interesting cases and fifty new illustrations. The number of eclampsia cases has been increased to thirty, but if any of my readers should still consider that these do not afford sufficient data from which to judge of the utility of the method of treatment adopted, I would refer them to the *Journal of Obstetrics and Gynæcology of the British Empire* for July, 1905, where they will find the record of a consecutive series of fifteen cases successfully treated by the same method.

I am deeply indebted to Dr. John Lindsay for the reports on the two cases of fœtal abnormalities which he has furnished, and to Dr. James Adam for notes of a case of Phthisis. My thanks are also due to Dr. W. Ernest Thomson for the two drawings of the eye, to Professor McPhail for several other drawings, and to my various house-surgeons for their assistance in preparing reports of cases, specially to Dr. Joseph White for a number of photographs taken by him.

R. J.

20, ROYAL CRESCENT,
GLASGOW, W., 1905.

PREFACE TO THE FIRST EDITION

For difficult obstetrical cases no hospital in the United Kingdom can compare with the Glasgow Maternity Hospital. During the eleven years that I have been on the staff my experience in obstetrics has been both varied and extensive. I have endeavoured to make use of these exceptional opportunities, and the results of my experience will be found in the following pages.

I think it will be generally admitted that the clinical teaching of midwifery in our schools and universities is in a most unsatisfactory condition. While clinical medicine and surgery rightly receive a large amount of attention, the teaching of midwifery is almost entirely systematic. The attendance on twelve, or even twenty, labours cannot be considered a sufficient clinical training. The fact is, graduates have to gain their clinical experience in midwifery after they have become qualified. This is not as it should be, and it is high time for attendance in the wards of a maternity hospital for some months to be made compulsory.

In 1898 a very heated discussion was carried on in the *British Medical Journal*, initiated by a paper of mine on "Aseptic Midwifery." The views upheld in that paper were severely criticised by several members of the profession, but not a single teacher raised his voice against them. For the benefit of my critics and others, I wish to state that an extensive later experience has most fully demonstrated the superiority of aseptic to all other methods. What asepsis has done for surgery it can and will do for midwifery, and I trust that the day is not far distant when every practitioner or midwife who takes upon himself or herself the responsibility of attending women in labour will realize this, and act accordingly. Then, and only then, will puerperal septicæmia become rare. It is terrible to think that this frightful scourge is still so deadly, when all that is required to check its ravages is perfect cleanliness.

The illustrative cases given have, with very few exceptions, been treated by myself. I have given a fairly large number in connection with cardiac disease, in order to illustrate, as far as possible, the different lesions. This condition is very inadequately dealt with in most text-books, and I have, therefore, treated of it at some length. As regards eclampsia, I have given full records of twenty-one cases, so that each reader may be able to form his own conclusions. In my hands the treatment by saline infusions has given very satisfactory results, and I can with confidence recommend it.

I am deeply indebted to Dr. W. E. Fothergill for his kindness in allowing me the use of so many of his plates; to Dr. W. S. Playfair, Sir J. Halliday Croom, and Dr. Berry Hart, also for the use of plates; to Dr. John Lindsay for many admirable drawings; to Messrs. J. Gardner and Son and Messrs. A. Young and Son for the illustrations of instruments; to Dr. G. Balfour Marshall for photographs of the application of forceps; to Professor McPhail, of St. Mungo's College, for the water-colour drawing of the liver; to Drs. John Brownlee and James Todd for notes of fever cases; to Dr. James Adam for notes and plates of his interesting case of exstrophy of the bladder; to my various residents who have so carefully reported the cases; and to Dr. Carstairs C. Douglas for his kindness in examining and reporting on specimens, and also in reading the proofs with me.

R. J.

GLASGOW, *January*, 1903.

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CHAPTER I

INTRODUCTORY

THE science of medicine has made immense progress during the last hundred years, and in no department is this progress more marked than in that of obstetrics. Such men as Amand, Grégoire, La Motte, Manningham, Moss, Smellie, Roederer, and the Hunters certainly did much for this branch of the profession in the eighteenth century, a period which saw the end of the midwives' furious opposition to the practice of midwifery by men. The introduction of the phantom in teaching, the employment and improvement of the forceps, the discovery of the decidua reflexa, the researches on the placenta, and the publication of the atlas of the gravid uterus were undoubted gains. But puerperal fever remained the same terrible scourge that it had been. For obstetricians in their maternity hospital work it possessed the same terrors that hospital gangrene and erysipelas had for surgeons.

The year 1847 is a memorable one in the annals of obstetrics. During that year two discoveries were made which have robbed childbed of two of its greatest terrors. These discoveries were the use of chloroform, and the nature of puerperal fever. No man can estimate the amount of suffering which Sir James Y. Simpson's discovery has been the means of alleviating. The second discovery, that of the nature of puerperal fever, has saved the lives of many parturient women. It is to a Hungarian named Semmelweis that we owe this great boon. He was assistant to the First Midwifery Clinique in Vienna. In the Second Midwifery Clinique the women were attended by students, while in the First they were entirely under the care of midwives. He noticed that the death-rate among the students' cases was very much higher than among the midwives'. In seeking for an explanation of this fact light was suddenly thrown upon the subject by the tragic death of the Professor of Medical Jurisprudence, who had pricked his finger at a post-mortem examination, and died of blood-poisoning.

Semmelweis recognised that his colleague had died of the very same disease that was causing havoc among parturient women. He came to the conclusion that the so-called puerperal fever was nothing more or less than blood-poisoning in a puerperal woman, and that the poison gained entrance to the system through some part of the genital tract, during labour or the puerperium. The explanation of the high mortality among the students' cases appeared plain. The men were conveying infection on their hands to their patients from the post-mortem and dissecting rooms, where they were working. The theory was put to the proof by making the men wash their hands in solutions of chlorine or chloride of lime, with the result that the death-rate quickly fell lower than that among the midwives' cases.

One would imagine that such an important discovery would have been hailed with satisfaction, but unfortunately this was not the case. Some accepted it, but the fathers of the profession did not relish being told that they had been conveying infection to their patients on their dirty hands. It suited them better to ascribe outbreaks of puerperal fever to the hand of Providence. Semmelweis was abused and his discovery scoffed at. He unfortunately was not an essentially strong man like Simpson. Disappointed and embittered, he was driven from Vienna, and, becoming insane, died in an asylum at a comparatively early age. By the irony of fate, his death was due to blood-poisoning.

To him belongs the honour of having discovered the nature of puerperal fever, and also of having adopted, in a crude way, the aseptic methods which are so largely used at the present time. The bacteriological investigations of recent years have confirmed his views. By their means sources of infection of which he probably knew nothing have been made plain to us, but this does not in any way detract from the importance of his discovery.

Antiseptic, and latterly aseptic, methods have completely revolutionized surgical practice, both in hospital and private work. In midwifery hospital work the results have been equally good, so that septicæmia is practically banished from all well-conducted maternity hospitals. About private work, judging from the returns of the Registrars-General, the same cannot be said. Puerperal fever is still far too common. The mortality from it is much as it was many years ago. While the mortality is high, the morbidity, as gynæcologists can testify, is also very great. If puerperal sepsis were completely banished, a great deal of gynæcological work would be done away with. If surgeons are able to prevent sepsis in the vast majority of their cases, there seems no reason why obstetricians should not be able to do the same. They have done it in the maternity hospitals, which at one time were hotbeds of infection, and they should be able to do the same in private work as successfully as the surgeons have done. That this is not the case is not to the credit of the profession.

One reason why the results in surgery are so good is because the great bulk of the work is done by specialists. Very few general practitioners do much surgery, but almost all the midwifery in Scotland is done by them. In England a very large amount of this work is in the hands of midwives, many of whom are quite untrained. If midwifery were done by specialists, as surgery is, no doubt there would be a great improvement. In cities this might be possible, but not in country districts. In the hurry of general practice there may be difficulties in the way of carrying out absolutely aseptic methods, such as are found necessary in hospital work, but this is certainly no excuse for the abandoning of ordinary cleanliness.

The act of parturition may be said to be a physiological one. Among primitive people this is perfectly true, and, so long as the process is left to nature, they experience very little difficulty, and have few cases of sepsis. Among civilized women, however, in very many instances, it borders dangerously on the pathological. Civilization has introduced many factors into our lives which people living in a state of nature do not have to reckon with. Nature is not a hard task-mistress, but if we infringe her laws, we must be prepared to pay the penalty.

The study of the bacteriology of the vagina has of late years thrown much light upon a few points, and undoubtedly much more will be learned from it. It is of the utmost importance to decide whether the vagina is septic or aseptic at the onset of labour. If it is septic, one would naturally endeavour to render it aseptic, and if it is aseptic, one's efforts should be put forth to keep it in that condition during labour and the puerperium. Many experiments have been carried out and much written on the subject. After a large number of elaborate experiments, the following are the conclusions to which Dr. Whitridge Williams of Johns Hopkins College, Baltimore, has come :*

"1. We agree with Krönig that the vaginal secretion of pregnant women does not contain the usual pyogenic cocci, having found the *Staphylococcus epidermidis albus* only twice in ninety-two cases, but never the *Streptococcus pyogenes* or the *Staphylococcus aureus* or *albus*.

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* *American Journal of Obstetrics*, vol. xxxviii., p. 468.

"2. The discrepancy in the results of the various investigators is due to the technique by which the secretion is obtained.

"3. As the vagina does not contain pyogenic cocci, auto-infection with them is impossible; and when they are found in the puerperal uterus they have been introduced from without.

"4. The gonococcus is occasionally found in the vaginal secretions, and during the puerperium may extend from the cervix into the uterus and tubes.

"5. It is possible, but not yet demonstrated, that in very rare instances the vagina may contain bacteria, which may give rise to sapræmia and putrefactive endometritis by auto-infection.

"6. Death from puerperal infection is always due to infection from without, and is usually due to neglect of aseptic precaution on the part of the physician and nurse.

"7. Puerperal infection is to be avoided by limiting vaginal examinations as much as possible, and cultivating external palpation. When vaginal examinations are to be made, the external genitalia should be carefully cleansed and disinfected, and the hands rendered as aseptic as if for a laparotomy. Vaginal douches are not necessary, and are probably harmful."

We may take it that at the onset of labour the vagina is usually aseptic. It is bathed with mucus from the cervical glands, and serum transuded from the vaginal bloodvessels. No pathogenic organisms are found in the fluid, but many different forms of bacteria are present. These bacteria may be looked upon as scavengers of the passage, as they have been shown to possess the power of destroying, in a short time, such virulent organisms as *strepto-* and *staphylococci*. They play a very important part in preventing sepsis. It is perfectly evident that septic organisms must often be introduced into the vagina, *e.g.*, with every act of coitus, and, unless stringent aseptic precautions are taken, every time an examination is made. Under ordinary conditions no harm results, as the protecting bacteria quickly deal with the intruders and cut their careers short. Nature has thus provided a means of protecting women from sepsis. If it were not so, there would be great risk of septic mischief travelling up into the uterus at every menstrual period, and thus gaining access to the system through the denuded surface of the interior.

Except with a macerated fœtus, the uterine contents are aseptic. In the cervical canal there is usually a plug of mucus, known as the operculum. It has been elaborately described as consisting of three layers. The upper or uterine one contains no bacteria, and is therefore aseptic. The middle one contains dead bacteria and quantities of leucocytes which act as phagocytes, and it is therefore antiseptic. The lower layer next the vagina swarms with bacteria which in the vast majority of cases are non-pathogenic—the ordinary vaginal bacteria ; but in cases where the vagina is septic they will be pathogenic. Gonococci are said to be the only organisms which can force their way through this cervical plug.

If we have an aseptic uterus and an aseptic vagina at the onset of labour, and that has been pretty conclusively shown to be the case, our whole aim should be to keep these parts in that condition during labour and the puerperium. Nature is able to do this under natural conditions, where absolutely no interference takes place. Our whole aim must be to assist Nature in her own way, and not try to supersede her methods by our own The methods to be adopted will be fully described in subsequent chapters, but the whole may be summed up in a few words—viz., absolute cleanliness and as little interference as possible

CHAPTER II

SYMPTOMS AND SIGNS OF PREGNANCY

Suppression of Menstruation—Morning Sickness—Bladder Symptoms—Ptyalism—Quickening—Fœtal Movements—Indefinite Symptoms—Changes in the Breasts—Changes in the Abdomen—Palpation of the Abdomen—Height of the Fundus—Ballottement—Changes in the Vagina and Cervix—Auscultation—Fœtal Heart—Funic Souffle—Diagnosis of Pregnancy—Pseudocyesis—Duration of Pregnancy.

THE indications of pregnancy may be considered under two headings—viz., subjective and objective indications.

The *symptoms* or *subjective* indications are those which the patient experiences herself, such as suppression of menstruation, morning sickness, quickening, etc. You cannot observe these indications, but must depend upon the patient's statement, and as she may wilfully or unintentionally deceive you, you must have something more definite to found a diagnosis upon.

The *signs* or *objective* indications can be seen, felt, or heard by you, such as enlargement of the abdomen, the areolæ round the nipples, ballottement, the movement of the fœtal parts, and the beating of the fœtal heart. These signs are, therefore, by far the most valuable indications, and, when taken in conjunction with the symptoms, will enable you to diagnose the condition.

THE SYMPTOMS OR SUBJECTIVE INDICATIONS.

Suppression of Menstruation.—This is usually the first indication a woman has that she is pregnant. It is known as physiological amenorrhœa, and is a very constant symptom ; but in a fair number of cases menstruation occurs a few times after impregnation, and in very rare cases it continues throughout pregnancy. One or two cases have been recorded where menstruation only occurred during pregnancy. On the other hand, it must be constantly borne in mind that amenorrhœa may arise from various other causes, such as anæmia, phthisis, nervous depression, etc. The menopause may also lead a woman to suppose that she is pregnant. In some cases pregnancy has occurred before menstruation has been established, and in others after the menopause. Menstruation is usually suppressed during lactation, but this does not always prevent pregnancy. In unmarried women who have had intercourse, the dread of pregnancy having occurred may suppress the flow, for a short time at all events. As a rule, when a woman is in good health, and has been previously regular in her periods, the sudden stoppage indicates pregnancy, if she has been indulging in intercourse.

CASE.—*Conception during Amenorrhœa.*—A well-nourished young woman consulted me on account of amenorrhœa of twelve months' duration. A year previously she had been very anæmic, and had taken a course of Blaud's pills. When I saw her there was no evidence of anæmia, and I was struck with her plump appearance. She stated that she had got very much stouter lately, not only in the abdomen, but all over. Her breasts were very large, and there was a distinct areola. Palpation of her abdomen revealed fœtal parts and distinct movements, and auscultation gave fœtal heart-sounds and a uterine bruit. She was about seven months pregnant. Conception had occurred during the amenorrhœa from anæmia. She was delivered of a full-time child some two months later.

Morning Sickness or Vomiting of Pregnancy.—This is a pretty constant symptom. It may commence immediately after conception—more usually after the first period has been missed—and may last until about mid-term, but in some cases it lasts throughout the whole time, while in others it may not come on until the later months.

It usually occurs on rising in the morning—hence the name ; but it may occur at any time during the day. It will be more fully discussed as a disorder of pregnancy. I have one patient who always menstruates for at least three months after conception, but is able to recognise that she is pregnant from the severe sickness which attacks her from the very first.

Bladder Symptoms.—In the early months most women are troubled with frequency of micturition, from the enlarging uterus pressing on the bladder. As a rule this passes off when the uterus rises above the brim of the pelvis, but it may recur in the later months. It is not peculiar to pregnancy, as any tumour in the pelvis may cause it.

Ptyalism.—This is not a very common indication, but may be very troublesome. The secretion of saliva may amount to several pints per day.

Quickening or Stirrage.—This is the first indication that a woman has, of life in the fœtus. It is usually felt about the sixteenth week, but I have known it to occur as early as the twelfth week. The movements first felt cause a sensation much like fluttering. They become stronger as the fœtus grows, and in some cases they are so violent as to cause considerable discomfort in the later months of pregnancy, while in others they are scarcely felt at all. If the fœtus dies, the movements of course cease, but very frequently they cease for, it may be, days, and then begin again, so that the cessation of movements for a day or two cannot be taken as an indication of the death of the fœtus. In a thin woman, in the later months, the movements can easily be seen, provided there is not very much liquor amnii in the uterus. In most cases you can easily feel them—a most important sign of pregnancy.

In cases where menstruation has been in abeyance at the time of conception, or where it has recurred several times after conception, it is important to ascertain the date of quickening, as from it an idea can be gained when labour is due. It will only give you an approximation, but taken in conjunction with the size of the uterus it will enable you to come within a week or so of the date.

Fœtal Movements are a most important indication of pregnancy if you can feel or see them, but you must not place much dependence upon statements made by the patient herself. She may wilfully mislead you, or, on the other hand, she may herself be misled by movement of gas in the bowels, giving her a similar sensation, when she is not pregnant. Women who are the subjects of pseudocyesis invariably maintain that they feel fœtal movements, and it is exceedingly difficult to convince them of error.

Indefinite Symptoms.—Shooting pains in the breasts, especially in the left breast, are often complained of. Sometimes cravings occur for unusual articles of diet. There may be disturbances of the nervous system, such as neuralgic pains, restlessness and irritability, insomnia, etc. These indefinite indications may occur regularly during the various pregnancies of a woman.

Signs of Pregnancy.—As you can observe these for yourself by inspection, palpation, or auscultation, they are the most important indications.

Changes in the Breast.—These are usually quite evident by the third month. The breasts increase in size, and the veins can be observed through the skin. The nipple becomes much darker in colour, and round about it the areola deepens in colour and increases in area. The colour of the areola differs according to the complexion of the patient, from a pinkish colour in a fair, to dark brown or nearly black in a dark, person. Surrounding the nipple will be seen a number of small papillæ—Montgomery's tubercles—about the size of a split pea. By squeezing the breasts a few drops of milk can be expressed. As the breasts enlarge " striæ " are formed on them, from the deeper layers of the skin giving way.

Of the breast signs of pregnancy, the darkening of the areola is the most important, especially in a first pregnancy. All the others may be present without pregnancy, or they may be wanting although pregnancy exists.

Changes in the Abdomen.—In some cases, especially in multiparæ, the abdomen begins to enlarge after the first period is missed, but in the majority there is no enlargement until after the third month. In fact, in many, the lower part of the abdomen becomes flattened, from the increased weight of the uterus causing sinking of that organ in the pelvis. By the end of the third month the fundus is at the brim of the pelvis, and from that time onwards it steadily rises in the abdomen and causes distention. Some women show very little distention, even at full time, while others become enormously stout. This depends upon the build of the patient, the laxity of the abdominal muscles, and, of course, the size of the child, and amount of liquor amnii in the uterus. In multiple pregnancies, the abdomen will be much larger than with a single child.

As the abdomen enlarges and the skin stretches, the *striæ gravidarum* begin to show similar to those on the breasts, but more distinct. The fresh ones are pinkish in colour, while the older ones are white. In some cases they are very numerous towards the end of pregnancy, and they can often be seen on the upper parts of the thighs. They are not peculiar to pregnancy, as a tumour, or dropsy, or even adipose tissue, will cause them. In rare cases very few are seen. They remain afterwards as white streaks, and show distinctly that the abdomen has been distended at some time, but not necessarily by pregnancy.

Besides these streaks, you will observe a general darkening of the skin of the abdomen, especially in dark women, and a distinct dark line, the *linea nigra*, extending down the centre of the abdomen, from the ensiform cartilage to the top of the symphysis pubis. It is usually most distinct at, and below, the umbilicus. This deposit of pigment is not confined to the abdominal wall, but may be seen on the face, giving it a blotched appearance, and also on the labia.

Inspection of the abdomen during the first three months will not usually reveal much enlargement, and in some cases there will be slight flattening. From the third month onwards enlargement becomes apparent, and progresses steadily until it reaches its maximum during the ninth month. During the last two or three weeks of pregnancy the fundus of the uterus sinks somewhat, but this is not very apparent to the eye. The contour is regular in outline. The umbilicus, which is at first depressed, gradually comes flush with the surface, and during the last two months it usually, though not invariably, projects somewhat. If the abdominal muscles are relaxed, as in multiparæ, the enlarged uterus will tend to fall forward and form a pendulous abdomen. With a contracted pelvis this will be very marked, especially if there is any lordosis. If the abdominal walls are thin, the movements of the fœtus will be distinctly seen.

Palpation of the Abdomen.—After the fundus has risen above the brim of the pelvis—*i.e.*, after the fourth month—it can be palpated through the abdominal wall. The patient should be lying on her back, with her knees drawn up. The warm hand or hands should be placed flat upon the abdomen, and firm pressure be made with the fingers. The patient's attention should be distracted from what is being done by engaging her in conversation, so that she will relax her abdominal muscles as much as possible. If the muscles are kept tense, you may not be able to feel the uterus at all. The uterine tumour will be felt somewhat round and smooth. The size will, of course, vary with the time of pregnancy.

From the sixth month onwards, or even somewhat earlier, the fœtal parts and movements may be felt. If the hand is kept on the abdomen for a little time, a distinct hardening of the uterus will be felt, followed by a softening. This intermittent contraction is never felt in any other tumour except a soft fibroid, so that it is a very valuable indication of pregnancy. The feeling of the fœtal parts and movements is a positive indication of pregnancy.

Height of the Fundus at Different Periods.—There are three points or landmarks at which the fundus should be felt at three periods of pregnancy. At the end of the third month the fundus is just rising above the brim—that is, it lies level with the top of the symphysis pubis; at the sixth month it reaches the level of the umbilicus; while at the end of the ninth month it may be felt at the tip of the ensiform cartilage. During the last fortnight or so it falls somewhat. As the rate of growth is regular, the time of pregnancy may be fairly accurately judged by the height of the fundus.

Ballottement.—This is a valuable sign. It may be got by external palpation of the abdomen with two hands, moving a part of the fœtus, such as the head, between them. The usual method of getting it, is by passing the fore or fore and middle fingers into the vagina, and placing their tips against the anterior fornix. A sudden push upwards of the fingers will cause the fœtus to bob up, as it were, in the liquor amnii, and in a few seconds it will fall again on the top of the fingers, with a gentle tap. The best position for the patient to be in is a half-sitting one. This movement is best felt between the fourth and seventh months, when there is plenty of room for the fœtus to move about in the liquor amnii. It is a very valuable sign of pregnancy, as there is practically no other condition which will give it.

Changes which may be observed in the Vagina and Cervix.—From about the third month onwards the mucous membrane will be noticed to be of a bluish colour. The labia will also be seen to have considerable pigment deposited in them, and their veins will often be noticed to be varicose, especially in the later months. The mucous discharge from the vagina will usually be abundant. These changes are due to the pressure of the enlarging uterus.

A digital examination will reveal, in the early months, that the uterus is somewhat low in the pelvis. The cervix will feel soft. At one time, shortening of the cervix was supposed to occur, and to the examining finger this may seem to be the case, but as a matter of fact it retains its full length until about the last two weeks of the pregnancy, when it is taken up into the uterine cavity, or dilates from above. In the anterior fornix the enlarged body of the uterus will be felt, and there will be very distinct arterial pulsation. The lower uterine segment will be felt to be distinctly softened. This is Hegar's sign of pregnancy. The best way to feel this is by passing the thumb into the vagina and a finger into the rectum, and then pressing the fundus downwards with the other hand on the abdominal wall, so that you can grasp the lower uterine segment between the finger and thumb. The segment will feel soft and almost as if there were no connection between the fundus and the cervix. The fundus above will feel globular. This is a very reliable sign, and can be obtained from the second month onwards. After the fundus has risen well into the abdomen, this softening of the lower uterine segment can be distinctly felt through the abdominal wall, by pressing the tips of the fingers deeply in, just above the symphysis pubis. In the later months the presenting part can usually be felt distinctly, especially if it be the head. The external os may admit the tip of a finger, especially in multiparæ. The cervical cavity will be filled with a plug of mucus. In many cases, towards the end of pregnancy, the external os will admit one finger or even two.

Auscultation of the Uterus.—Certain sounds may be heard, on listening over the uterus. The most audible is a loud blowing, heard best at the sides of the uterus. This is the *uterine souffle* or *bruit*, sometimes erroneously called the placental souffle or bruit. It is caused by the blood rushing through the curling arteries of the uterus, and not by the blood in the placenta. You cannot, therefore, diagnose the situation of the placenta from the point of maximum intensity of the sound. It is heard also in uterine fibroids, so it is not distinctive of pregnancy. In rate it corresponds with the mother's pulse. In many cases the pulsations of the abdominal aorta can also be distinctly heard.

Fœtal Heart-Sounds.—If the fœtus is alive, its heart can be heard beating, from the fourth month onwards. At first it is a faint double sound, not unlike the ticking of a watch heard through a pillow or clothing. You must be sure there is no watch in the bed, lest you be misled. As the pregnancy advances the sound grows stronger. It beats at a rate of from 120 to 140. In listening to it, have your finger on the patient's wrist to feel her pulse at the same time. If her pulse should be very quick you might mistake it for the fœtal heart, as you hear it in the abdominal aorta. The fœtal pulse should be much quicker than the mother's. The position of maximum intensity varies, according to how the fœtus lies *in utero*. Near term it is usually best heard about two inches below, and to the left of, the umbilicus, as the fœtus most frequently lies head downwards with back towards the left side. When the head presents, it is usually heard best below the umbilicus, and to whichever side the back is turned. When the breech presents, it will be heard best above the umbilicus, and in transverse cases below the umbilicus, nearer the pubis than in head presentations. As a rule, if the fœtus is alive, the heart can be heard, but this is not invariably the case (see Case IV., p. 52); a sudden change in the rate will indicate danger to the child. In difficult labours the fœtal heart should be auscultated from time to time, and if the rate is found to have increased greatly, or to have become slower or intermittent, interference is called for in the interests of the child. If you can make out two fœtal hearts beating at different rates you know you are dealing with twins, or if you find two points of maximum intensity at different parts of the abdomen, although there may be no appreciable difference in the rates, it will probably be a case of twins. With twins, however, you do not always hear both hearts, as one child may lie directly behind the other.

Funic Souffle.—On listening over the abdomen you will occasionally, but very seldom, hear a whizzing sound, synchronous with the fœtal heart. It is caused by the blood rushing through the cord, and can only be heard when the cord is wound round the child.

Fœtal movements can usually be distinctly heard and sometimes felt through the stethoscope. In a case of suspected death of a fœtus, I was able to assure the patient that the fœtus was still alive, as I both heard and felt it move, although I could not make out any fœtal heart.

Diagnosis of Pregnancy.—During the early months this is very difficult. The following conditions will point to it: Amenorrhœa, morning sickness, frequent micturition, discomfort in the breasts, increase in their size, the presence of a clear fluid in them, and darkening of the areola in primiparæ. The woman may be able to indicate other symptoms, such as cravings for unusual forms of food, etc., which she has experienced in former pregnancies.

On making an examination, in some cases there may be some distension of the abdomen, but in many it will be flattened for the first two months. The vagina will be dusky in colour, the cervix soft to the touch, and the uterus will be felt to be enlarged and slightly lower in the pelvis than usual. Distinct pulsation will be felt in the anterior fornix, and by passing a finger into the rectum and the thumb into the vagina and grasping the lower uterine segment it will be found to be soft (Hegar's sign). A bimanual examination will reveal the size of the uterus, and this should correspond with the supposed period of gestation. If you are in doubt do not give a definite opinion, but wait for a month or so, when you will probably get more certain indications.

From the fourth month onwards you will be able to test ballottement and to hear the fœtal heart. By the sixth month some of the symptoms, such as morning sickness, may have disappeared, but others will have become plainer. In addition, the abdomen will have enlarged, striæ will be beginning to form, and the *linea nigra* to show.

The fundus of the uterus will be felt about the umbilicus. The patient will also be able to tell you if she feels movements.

On palpating the abdomen the enlarged uterus will easily be felt, and, in many cases, the fœtal movements. Intermittent contractions will be apparent, and through the abdominal wall you will be able to make out the softening of the lower uterine segment. Auscultation should reveal the uterine souffle, and if the child is alive should enable you to perceive the sound of its heart. By a vaginal examination you will notice the bluish discoloration, the softening of the cervix and lower uterine segment, the enlargement of the uterus, and perhaps you may feel the head if it is presenting. Ballottement will be easily got.

At the sixth month a definite diagnosis can usually be made, as you can then hear the fœtal heart and feel the fœtal parts, both of which indications are absolute.

For the first two or three months it is very difficult to distinguish a pregnant from a subinvoluted uterus. With subinvolution the cervix is not softened, and amenorrhœa is not generally present ; but, on the other hand, you may have menstruation along with early pregnancy. One must be guided a good deal by the history. It is a safe rule never to pass a sound in an enlarged uterus where there is the slightest chance of pregnancy.

In an extra-uterine gestation the uterus will be enlarged and softened, but a careful bimanual examination should reveal the gestation sac lying near the uterus and attached to it.

The diagnosis between a tumour and pregnancy is not always easy, and the two not infrequently co-exist. With an ovarian cyst you will get no intermittent contractions, no fœtal parts, no fœtal heart-sounds, and no uterine souffle. With a soft fibroid you may get intermittent contractions and a uterine souffle, but no fœtal parts or heart-sounds. With a hard fibroid there will be no contractions, but a uterine souffle, and of course no fœtal parts or heart-sounds. With fibroids profuse menstruation will be the rule.

Near full time the diagnosis of pregnancy is usually easy. The fœtal parts should be easily felt, and, if the child is alive, the heart should be easily heard. The presenting part can generally be easily felt through the vagina.

Never venture an opinion without making a thorough examination, and do not say a woman is pregnant unless you are absolutely sure of your diagnosis.

The following case will illustrate this : A single young woman had run the risk of conception, and although menstruation continued, she noticed that she was increasing in size. After some months of terrible anxiety she consulted a doctor, who, without examining her, said that he had no doubt she was pregnant and nearing full time. She felt so distressed that she contemplated suicide, but her sister fortunately reasoned her out of this. All preparations were made for the birth, and she went to a nurse's house for the confinement. When the nurse palpated the patient's abdomen she could make nothing out, so asked me to examine her. I found there had been a considerable deposit of fat, and the abdomen was certainly distended, but the uterus was a normal size. There was no indication of pregnancy, and I could hardly convince the patient that there was nothing wrong with her.

In dealing with unmarried women one must be exceedingly careful. They will sometimes try their uttermost to deceive you, often to the extent of absolutely denying having had connection. In one case, a girl, who had not menstruated for seven months, consulted me as to her condition. She had all the signs and symptoms of pregnancy, and as I distinctly felt fœtal movements, and heard the fœtal heart, I told her she was seven months pregnant. I was indignantly told this was quite impossible. Next day her mother called on me, furious that I had dared to say such a thing about her daughter. As I was absolutely sure of my diagnosis, I advised her to wait a couple of months, and then to come and discuss the matter with me. About two months later I was called to see the girl one night by the indignant mother, who had been diligently poulticing the daughter's abdomen for cramp until a child had been expelled, rupturing the perineum in its exit. The girl had kept up the farce to the very end, and completely deceived her mother, until the arrival of the infant made further deception impossible.

Pseudocyesis or Spurious Pregnancy.—This condition usually occurs in hysterical women who are very desirous of bearing children, and especially in women near the menopause. Menstruation, as a rule, will be entirely absent, or very scanty and irregular. The abdomen and breasts enlarge, and the patient will usually complain of all the ordinary symptoms, such as morning sickness, etc., and will profess to have quickened, and to feel the movements regularly. In her own mind she will be firmly convinced that she is pregnant. She may make all preparations for her confinement, and have her nurse in attendance. In some cases, a spurious labour will come on, and the patient will profess to feel the ordinary pains of labour, but the result will be even less than that of the proverbial travailing mountain.

Many of these cases are not correctly diagnosed until the patient supposes she is in labour, and others again only after her supposed full time has been passed, simply because no examination has been made by the medical attendant. When a woman engages you to attend her, you naturally believe her statement that she is pregnant, and you do not examine her before labour, unless there is some reason for doing so. When a case has gone so far as this, the *dénouement* is certainly anything but pleasant for the patient and friends, and they are, unfortunately, sometimes inclined to blame the unoffending medical attendant.

Diagnosis.—Place no dependence upon the woman's statements, but make a very careful examination. Percussion of the abdomen will give a tympanitic sound all over. Palpation will usually be very unsatisfactory unless chloroform is administered, as the recti muscles by their rigidity will prevent you making out that there is no tumour present. Auscultation will not give a fœtal heart or a uterine souffle. *Per vaginam* it will be felt that the cervix is not softened, nor the uterus enlarged. To make absolutely sure, give the patient an anæsthetic, and as she comes under its influence the abdominal tumour will largely disappear, and you can press your hand down until you feel the spinal column.

I have seen a good many cases of this condition. The first one was in a nurse who had married about the menopause. She, of course, had all the symptoms by heart. It was very difficult to convince her that her expectations were doomed to be disappointed. Among hospital cases I saw one woman whom I had delivered two years previously. She had actually deceived herself into the belief that she was in labour, and had sent for assistance. Two students saw her, and told her that everything as right, but was the labour was only beginning they would not wait. A couple of days later I was asked to see her, and found that she was not pregnant at all. The most recent case I have seen was in a widow who had unfortunately been having intercourse. She was menstruating regularly, but assured me that she felt strong movements. She declined to accept my assurance that she was not pregnant, and only came to believe me after her supposed full time had passed.

The Duration of Pregnancy.—In the human female pregnancy lasts on an average 280 days, counting from the first day of her last menstrual period. Impregnation generally occurs shortly after the cessation of menstruation, but this is not invariably the case. If it should occur just prior to the first suppressed period, your calculations may be wrong by about a fortnight. In some women the gestation period is undoubtedly longer than in others. While we speak of pregnancy lasting for nine months, it really lasts ten lunar months, or 280 days—*i.e.*, ten menstrual cycles, as menstruation usually occurs every twenty-eight days. With some women menstruation occurs every twenty-six days, and ten of their cycles will give 260 days. In some cases this will be found to work out all right, but not in all.

To find the approximate date of confinement, count back three months from the first day of the last menstruation, and add on seven days. This may not give you the exact date, but it should be within a few days of it, provided impregnation has occurred shortly after menstruation has ceased.

If menstruation has been in abeyance at the time of conception, you must then judge by the size of the uterus and the date of quickening; but this latter date is a very uncertain one, as quickening may be felt as early as the twelfth week, or not until the eighteenth or twentieth, or even later, and in rare cases not at all.

Gestation is occasionally, but very seldom, prolonged for more than 300 days from the cessation of menstruation. I have seen a case where 305 days had elapsed from the cessation of menstruation until the patient was delivered. The os in this case was completely occluded (see Case I., p. 215).

CHAPTER III

COMPLICATIONS OF PREGNANCY

Diseases of the Alimentary System—Inflammation of the Gums—Ptyalism—Affections of the Stomach—Pernicious Vomiting—Constipation—Diarrhœa—Diseases of the Liver—Gall Stones—Appendicitis—Hæmorrhoids.

SOME of the complications met with are due to the pregnancy, while others are quite independent of the condition. In the latter, the disease may be adversely influenced by the pregnancy, or the disease may have an adverse influence on the pregnancy, even to the extent of causing a premature termination.

I shall shortly consider the more important complications, taking them up as far as possible under the different systems.

Diseases of the Alimentary System.—The teeth are not infrequently attacked by caries. Toothache, also, sometimes arises without any apparent disease of the teeth. In the latter condition the pain is due to neuralgia, and, even if it does not yield to nerve tonics, will probably subside in the later months of pregnancy. While it is not advisable to have any prolonged dental operation during pregnancy, there is very little risk in having bad teeth extracted under anæsthesia. Either chloroform, ether, or gas should be administered to prevent shock.

Inflammation of the Gums is sometimes seen. The gums become spongy and bleed easily. This may be associated with scurvy from improper feeding, or with purpura hæmorrhagica, as in Case I., p. 42. Troublesome stomatitis may also arise and cause considerable disturbance of the digestion.

Treatment.—Give astringent antiseptic mouth washes, and proper diet.

Ptyalism.—Profuse salivation is a very rare complication. In many thousand cases of pregnancy I have never met with a marked case. I have only once seen it, and, curiously enough, the case turned out to be one of pseudocyesis. The cause of the condition is probably a reflex irritation of the sympathetic nervous system, but beyond that one cannot be more exact. It is liable to recur in subsequent pregnancies. Astringents and belladonna are usually given. It generally disappears in the later months of pregnancy.

Affections of the Stomach.—The stomach is usually very irritable, and most patients suffer more or less from some form of stomachic trouble. Different forms of dyspepsia are common. Hyperacidity with heartburn and water-brash is often complained of, but the most common form of disturbance is vomiting, or what is usually called morning sickness. It may only be nausea with or without actual vomiting, or vomiting alone without any great nausea. The patient may only vomit her breakfast and retain all her other meals, or she may reject all her food. The condition may first manifest itself about the time the first menstrual period is suppressed, but in some cases it begins immediately after impregnation. Patients have occasionally told me they could tell when they had had fruitful intercourse, as they felt sickness next morning. The sickness usually ceases about the time life is first felt, but, in some cases, it persists throughout the pregnancy, while in others it only occurs during the latter half.

The ordinary morning sickness may be looked upon as physiological, as it has no bad effect beyond discomfort; but we occasionally meet with a case of incessant or pernicious vomiting, which may prove to be one of the most intractable complications of pregnancy with which we can possibly meet.

Treatment.—In ordinary cases treatment consists in regulating the bowels, and giving easily digested foods. The medicines which are most useful are generally alkalies combined with sedatives. My favourite drugs are oxalate of cerium (10 grains), combined with bismuth subnitrate (15 grains), given in milk about a quarter of an hour before food. As regards food, some patients have cravings for articles of diet which one would not expect to be retained and digested. I have known a woman to crave for gingerbread, which she could retain and digest, while she rejected what one would have considered much more suitable food. The craving should be indulged so long as the article is a suitable one.

Pernicious Vomiting.—This is an exceedingly grave complication of pregnancy. If it cannot be relieved, the patient will become so exhausted that she may die, during delivery, or very shortly afterwards.

The pathology of this condition is not clear. Many theories have been propounded, but the etiology of the condition is still very obscure. Reflex irritation from distention of the uterus is often assigned as a cause, and on this account the condition is said to be most frequent in elderly primiparæ and in cases of overdistention from hydramnios or a multiple pregnancy. Graily Hewitt maintains that it is due to a displacement of the uterus. I have never yet seen a case of vomiting which could be ascribed to displacement of the uterus, and, of the many cases of displacement of the pregnant uterus with which I have had to deal, none were troubled with excessive vomiting. One of the most recent theories ascribes the cause to absorption of the syncytium, but there is no proof of this. In some cases there is a strong neurotic element present, and chronic gastritis or a gastric ulcer will predispose to an attack. Renal insufficiency is sometimes present, especially in cases where the vomiting begins in the later months. The more cases I see, the more firmly am I convinced that the cause is a toxic one, and that the toxin, whatever it is, acts through the nervous system. The source of the poison seems to be in the uterine contents, and when the uterus is completely emptied the vomiting almost invariably ceases. When we once thoroughly understand the tissue metabolism which occurs during gestation, the etiology of pernicious vomiting and of eclampsia will in all probability be made clear to us.

It is not uncommon to find blood in the vomit, and there may be so much as to amount to severe hæmatemesis, as in Case I.

Case I.—Mrs. B., 7-para, aged twenty-six, was sent into hospital from the country, as a case of pernicious vomiting of pregnancy. A few days before admission she had vomited a very large quantity of coffee-ground material. The usual gastric sedatives had been tried without any benefit. The patient was about seven and a half months pregnant.

The bowels were very thoroughly cleared out and rectal alimentation adopted. The vomiting never recurred after her admission. She complained of some pain in the stomach, but beyond that she felt well enough, except that she was very weak.

As the vomiting had ceased I did not induce labour, but about twenty-eight hours after admission, without any warning, she expelled the contents of the uterus *en masse*. The labour was painless until the mass was passing the vulva. The sac was at once ruptured, but the fœtus showed no indications of life. There was no hæmorrhage.

She was able to retain nourishment from that time onwards, but in spite of that, and although she was freely stimulated with brandy and champagne, she gradually sank, and died on the third day. The temperature remained normal.

The post-mortem examination revealed nothing in the stomach, except that it was dilated, and had one or two small hæmorrhagic points under the mucous membrane. There was some slight erosion of the mucous membrane at the lower end of the œsophagus. Death seemed to have resulted from asthenia. There was no indication of sepsis.

The result in this case was very disappointing. There seemed every chance of her recovering, as she was able to take and retain large quantities of nourishment after the labour was over. The severe hæmatemesis and the pain in the stomach led me to expect to find a gastric ulcer, but there was none. The bleeding may have come from the erosion at the lower end of the œsophagus, as there was some varicosity of the veins there, but no definite lesion could be found in any vessel. The painlessness of the labour was a remarkable feature.

Case II.—Mrs. P., 6-para, aged thirty, was sent into hospital with a history of persistent vomiting and great pain in the stomach. She was about seven months pregnant. The vomiting had been very violent during the first three months of the pregnancy, and it had then ceased for about two months. It then began again, and had been incessant for fourteen days. There had then been some relief for about three weeks, but during the last three she had suffered greatly from severe epigastric pain and occasional rigors. There had been blood in the vomit lately, and she had passed very black and tarry motions. There was a fair amount of albumin in her urine.

After admission the vomiting was not very severe, but she complained very much of epigastric pain. After a few days, as the case did not seem to warrant any obstetric interference at that time, we transferred her to the Royal Infirmary. After three days in the Royal Infirmary vomiting ceased entirely, and she was well enough to go home in a fortnight. The albumin had disappeared from the urine.

As soon as she went back to ordinary diet at home the vomiting recurred, and she had a severe attack of diarrhœa. She returned to the Royal Infirmary in a fortnight, but in spite of treatment, the vomiting persisted, so they sent her to us for induction of labour nine days later.

On admission the patient was examined by the resident, who tried to introduce his finger through the os. There was no indication of labour coming on. When I saw her a couple of hours later, I found there was no need of inducing labour, as the os was nearly half dilated. The labour ended naturally about five hours later. The child, a female, was alive, and weighed seven pounds, so it must have been nearly, if not quite, at full time. A mixture of bismuth and morphia was given, and the vomiting ceased a few hours after delivery, and she was able to take a fair amount of nourishment without pain. She made a good recovery.

The melæna, blood in the vomit, and severe gastric pain led me to suppose that there was a gastric ulcer, but of that I am not sure. The commencement of labour so soon after the examination was probably a mere coincidence, as I think she was at full time. I have more than once, however, had labour come on spontaneously in cases admitted for induction, where the cause has evidently been excitement, and that may have been the case here.

Case III.—Mrs. D., 4-para, aged twenty-eight, was admitted to the Glasgow Maternity Hospital on October 23, 1902, suffering from pernicious vomiting. Dr. Fraser of Kilsyth, who had sent the patient in, had treated her for some weeks with the usual gastric sedatives and rectal feeding, but without avail. The patient stated that in her first two pregnancies she had experienced no inconvenience, but during her third, vomiting had begun after the sixth month and had lasted till the end of the pregnancy. When not pregnant she had never been troubled with indigestion. She had last menstruated in March, so that she was about seven months pregnant. At the beginning of the fourth month nausea with retching had set in. This was most marked in the mornings There was no pyrosis, and the appetite was good. Towards the end of the fifth month the sickness had become more persistent and the vomiting excessive. She remained in bed under treatment, and the vomiting improved slightly for a short time, but soon became worse. The appetite was fairly good, and she had a craving for potatoes, but everything she took was immediately rejected. There were never any streaks of blood or coffee-ground material in the vomit.

Condition on Admission.—The patient seemed to be *in extremis.* She was emaciated to a degree ; her face was pinched and drawn, and her extremities cold. The temperature was 95° F., and the pulse running at 140, intermittent, and thready in character. Her breath had a sourish smell, and she complained of thirst, and kept asking for water.

As Dr. Fraser had already tried medicinal means, including rectal feeding, I decided to induce labour at once, although there seemed little hope of saving the woman's life. She was at once given $\frac{1}{30}$ grain of strychnine hypodermically, 1 pint of normal saline solution under the breast, and 2 ounces of brandy by the rectum. A vaginal examination revealed that the os was quite patent, and a small head was in the pelvis. I ruptured the membranes as the quickest way of inducing labour. Sips of very hot water were given, and rectal enemata every few hours. About two hours after rupturing the membranes the patient began to complain of labour pains ; the pulse was now 125, and the temperature still 95° F. Three hours after this a dead fœtus was expelled almost painlessly ; it weighed $2\frac{1}{4}$ pounds, and was extremely emaciated, but not macerated. There was no post-partum hæmorrhage. The temperature was now 97·2° F., and the pulse 136, intermittent, and almost imperceptible at the wrist. Strychnine ($\frac{1}{30}$ grain) was given hypodermically. Three hours after delivery the patient was very collapsed ; the pulse could not be felt at the wrist, and the extremities were cold. Another saline injection (1 pint) and $\frac{1}{30}$ grain of strychnine were given. This seemed to rally her a little. As the rectal enemata were not being retained 1 drachm of ice-cold peptonized milk and sips of iced champagne were given by the mouth.

Next day the patient had improved slightly, and was able to retain peptonized milk and champagne ; but she excreted no urine. The improvement continued, and on the following day 4 ounces of urine were obtained by catheter. It was very concentrated (specific gravity, 1030) and heavily loaded with albumin. Large quantities of crystals of oxalate of lime were found, but no tube casts. The recovery was uninterrupted.

On admission this case seemed quite hopeless, and I did not feel justified in holding out any hopes to the friends, but fortunately the gloomy prognosis was not fulfilled.

Case IV.—Mrs. G., 1-para, aged thirty-eight, was seen by me in consultation with Dr. Robert Dunsmuir, in Renfrew, to whom I am indebted for the notes of the case. The patient had been married on September 28, and had last menstruated on September 17. Dr. Dunsmuir first saw the patient on November 30, and was informed that the sickness had commenced on the morning of October 24. At first it only occurred in the morning, and she was fairly well throughout the day, and fit for her usual household duties. Two days previous to Dr. Dunsmuir's visit the vomiting had become so incessant that the patient had been forced to keep her bed.

On inspection the breasts showed a slight darkening of the areola, with traces of Montgomery's tubercles. The patient's diet was carefully regulated, and an alkaline stomachic mixture administered. There was an amelioration of her symptoms until December 9, when there was a recrudescence of the nausea and vomiting to such an extent that the stomach rejected everything. Her sleep was very broken, and disturbed by frightful dreams. Rectal alimentation was now resorted to, and nothing given by the mouth except a little iced water to relieve the intense thirst. A morphia suppository was administered each night to insure sleep. The patient's condition did not improve. Whenever she raised her head off the pillow she retched violently. There was considerable bile in the vomit. The temperature now began to rise slightly above normal, and the pulse to quicken. Her face became drawn and pinched, and her aspect one of absolute exhaustion.

I saw the patient with Dr. Dunsmuir on December 26. She had a very drawn, pinched expression, her pulse was very weak, and her voice feeble. She was extremely exhausted. Whenever she raised her head retching came on. She was in an extremely nervous condition. A vaginal examination revealed that the uterus was enlarged and the cervix softened. The uterus was not anteflexed, but its posterior wall seemed to bulge somewhat against the rectum.

We determined to again try rectal alimentation combined with oxalate of cerium and bismuth by the mouth, but there was no improvement; so on December 30 I induced abortion by passing a sterilized sound and rupturing the sac. I packed the cervix and vagina with gauze. On the following day I dilated the cervix slightly and cleared the uterus out with a flushing curette. There was no more vomiting, and the patient made a slow but good recovery.

Case V.—Mrs. A., aged thirty-two, 1-para, was admitted to the Hospital on September 17, 1904, complaining of incessant vomiting of a fortnight's duration.

Menstruation had ceased on July 20. Prior to that time she had always been quite regular, but at each period she had had severe pain, beginning two days before and lasting until the flow was free, when it ceased. Lately she had suffered from pain low down in the left side of the pelvis, and there had been disturbance of micturition.

A fortnight ago sickness had commenced, nausea and ordinary morning sickness at first, but for the last week the vomiting had been incessant, and she said she was vomiting the whole day long, and so much at night that she could not sleep. She had never noticed any blood in the vomit.

The patient was emaciated, and had an anxious expression, a foul breath, a furred tongue, and vomited frequently, more especially when she got sips of milk. The vomit had a bilious appearance, but there was no blood in it. Vaginal examination showed that the vulva and vagina were normal, the mucous membrane of a bluish colour. The cervix was soft, and was pulled somewhat to the left side, and pointed towards the symphysis pubis. The uterus was enlarged and softened, Hegar's sign present, and was acutely anteflexed, while the lower posterior portion of it was drawn back to the rectum by the somewhat shortened posterior ligaments. There was some tenderness in these ligaments, and the patient said she had some pain at stool. The right ovary was palpable high up. The urine was highly coloured, with phosphatic deposit, and crystals of urate of ammonium ; no albumin, sugar, blood, or casts.

Treatment.—The patient's bowels were well washed out by a couple of high enemata. As even little sips of milk were rejected, all feeding by the mouth was stopped, and nutrient rectal enemata, alternating with meat enules, were given every four hours. Five-grain doses of oxalate of cerium were given by the mouth every four hours.

September 21.—The patient has only vomited about three times to-day, and has improved very much. Sips of iced peptonized milk were given by the mouth in addition to the rectal feeding. She occasionally vomits this milk.

She continued to improve, and by October 1, a fortnight after admission, feeding by the mouth was commenced cautiously, and as the stomach retained the food the enemata were stopped in a few days. By the time she left the hospital, on October 17, she was taking full diet well. She had gained considerably in weight, and had entirely lost the anxious, drawn expression.

In this case there certainly was a displacement of the uterus, which would favour the displacement theory of causation, but if that were the cause the patient certainly recovered without anything having been done to replace the uterus. If there had been no immediate improvement I would have tried the effect of supporting the anteflexed uterine body by means of an elastic bag or plugs, but the result of our treatment was so satisfactory that I did not feel called upon to do this.

In connection with diseases of the blood, a case of pernicious vomiting associated with purpura hæmorrhagica will be detailed (see p. 42).

Treatment of Pernicious Vomiting.—The patient should be kept quiet in bed, and her bowels should be cleared out. If food is given by the mouth it should be peptonized, and if this is rejected, feeding by the mouth should be entirely suspended, and recourse had to rectal alimentation. Nutrient enemata of 4 ounces of peptonized milk, beef-tea, and liquid peptonoids, etc., can be given three times daily, or even oftener. The rectum should be washed out with simple warm water once or twice daily to allay irritation. Nutrient milk or meat suppositories may be used alternately with the enemata. If the patient has much thirst, a pint of normal saline solution should be injected high up into the bowel once a day. If there is renal insufficiency, I would give saline injections subcutaneously. For a week or ten days the patient should have no food by the mouth; sips of hot water may be allowed her, but the less she takes into her stomach the better. When this time has elapsed she may be allowed peptonized food by the mouth.

As regards drugs which have been recommended, their name is legion. The most useful ones are bismuth, oxalate of cerium, chloral, and the bromides. The bromides and chloral may be given by the rectum. Small doses of morphia given hypodermically are sometimes useful, but at other times only increase the sickness. Stimulants are often required, and they can be given by the rectum. Small chips of ice soaked in brandy are sometimes useful. The best stimulant, however, is strychnine, given hypodermically.

Obstetrical Treatment.—In all cases of persistent vomiting a thorough examination should be made *per vaginam* before the patient has become exhausted. If a displacement of the uterus is found, it should be corrected. If there is any disease of the cervix, or old inflammatory condition, this should be treated at once. Painting the cervix with cocaine, and dilating it with the finger, occasionally does good, probably by acting through the nervous system. In fact, in some cases where there is a strong hysterical tendency, the visit of a consultant often does good, if he can impress upon the mind of his patient that the remedies he is ordering will be sure to relieve her. I have seen this prove effectual in a hysterical case. If ordinary means fail, induction of an abortion, or premature labour, must be resorted to. This, unfortunately, often proves fatal, because the emptying of the uterus is, as a rule, only resorted to when the patient is too much weakened to stand the strain. It is very difficult to say when one should resort to operation, but I am firmly convinced that the tendency is to delay the operation too long. I think that, if, after a week or ten days of rectal alimentation, the stomach will not retain food, one is justified in emptying the uterus. I have more than once found the vomiting cease as soon as the bougie was introduced into the uterus. The greatest care must be taken to stimulate the patient freely during the induction, and for some time after it, to counteract shock, which may prove fatal in such an enfeebled constitution.

Constipation.—Women are unfortunately very prone to constipation, and in pregnancy it is very common. It is often accompanied with hæmorrhoids. Patients should be warned to keep their bowels free by regulating their diet, and, if necessary, taking an aperient regularly. If they do not pay attention to this, the waste products of tissue metabolism will accumulate in the system, and the kidneys, in their endeavours to rid the system of these waste products, may have a greater strain thrown on them than they can bear. The result will be that albumin appears in the urine, and the excretion lessens, until finally, if relief is not obtained, the nerve centres are poisoned and eclampsia results. The liver, too, is involved, but the rôle it plays I am not prepared to state. I firmly believe that if the organs of excretion are kept up to the mark there will be no fear of eclampsia.

Treatment.—As a rule, active purges are not necessary, unless there is a threatening of eclampsia. In ordinary cases, a tumblerful of hot water, with or without a small amount of saline, the first thing in the morning, is sometimes sufficient to cause an evacuation of the bowels, and it also helps to flush the kidneys. Cascara sagrada alone, or combined with strychnine, belladonna and aloin, is a very good remedy for constant use.

Diarrhœa.—Diarrhœa is not so frequently met with as constipation. It may be caused by pressure irritating the bowel.

Treatment.—The ordinary astringent medicines will usually check it, but, if it is nervous in origin, nerve tonics may be required. If there is feverishness accompanying it, one must not forget that it may possibly be caused by enteric fever.

Diseases of the Liver.—Catarrhal jaundice is occasionally seen. The patient may have been subject to attacks before she became pregnant. Premature labour may come on. Regulating the diet and giving the patient a few doses of calomel, followed by a saline draught, will quickly correct the condition.

CASE.—Mrs. D., aged twenty-six, 3-para, eight months pregnant, was admitted to the hospital in labour, and suffering from marked jaundice.

Her other two pregnancies had been normal. Three days before admission the patient had had an attack of severe vomiting, accompanied by marked nausea. Previous to this she had been very constipated. The jaundice had come on with the sickness. She had had some pain of a shooting character, simulating biliary colic, but it had been very slight.

The patient was markedly jaundiced all over the body. The sclerotics were deeply tinged. The liver dulness was normal. There was no sign of a distended gall-bladder, nor was there any tenderness over the hepatic area.

The fæces were very white and foul-smelling, but on examining them carefully no stone could be found. The urine was of a dark-greenish colour, and contained large quantities of bile, but no leucin or tyrosin. Otherwise the patient was healthy.

The labour was very quickly over. The child, a female, was alive, and weighed 4½ pounds. There was no bile in its urine. It was kept in the incubator, and although it lost weight at first, it did well for a time, but died when 5 months old.

After the birth of the child the jaundice began to lessen, and by the seventh day it had disappeared. The puerperium was uneventful. Calomel and salines were administered a few times.

A very much more serious condition, however, occasionally arises —viz., **acute yellow atrophy** of the liver. This condition is not peculiar to pregnancy, but a large proportion of the recorded cases have been in pregnant women. The liver substance becomes acutely degenerated and practically destroyed. In many cases it shrinks to about half its size, and may only be about half the ordinary weight. The jaundice is intense, and the urine contains leucin and tyrosin. The cause of the condition must be an acute poisoning. In several of my cases of eclampsia I have found a condition in the liver which closely resembled the early stage of acute atrophy.

The prognosis of such a case is hopeless.

Treatment.—Stimulate the patient freely and give purges. Saline transfusion might be of some use.

Gall-Stones.—I have never yet met with a case of gall-stones during pregnancy, but they must occasionally occur.

Treatment.—If opiates fail to relieve the suffering surgical interference will be called for. The operation may cause an abortion of premature labour, but the chances are that it will not affect the pregnancy.

Appendicitis.—This condition occasionally arises during pregnancy. If there is any indication of suppuration, an operation should be done at once.

Hæmorrhoids.—These are very common in pregnancy, and are sometimes very painful. The pressure from the uterus aggravates the condition. Palliative treatment, with sedative ointments and suppositories, and keeping the bowels free, is all that one can do, as an operation is not advisable. They usually improve rapidly after delivery.

CHAPTER IV

COMPLICATIONS OF PREGNANCY—*Continued*

Affections of the Kidneys—Nephritis—Anomalies of the Urine in Pregnancy—Polyuria—Glycosuria—Diabetes Mellitus—Hæmaturia—Acetonuria—Peptonuria—Pyuria—Leucin and Tyrosin—Renal Calculus—Renal Tumours—Floating Kidney—Cystic Disease—Hydronephrosis—Pyonephrosis—Bladder Complications—Incontinence and Retention of Urine—Vesico-vaginal Fistula—Vesical Calculi—Cystitis.

AFFECTIONS OF THE KIDNEYS.

IN pregnancy the kidneys are often affected, giving rise to what is known as the *kidney of pregnancy*. The condition can hardly be looked upon as one of acute or chronic inflammation. The kidney substance may be slightly enlarged and somewhat anæmic, with some fatty infiltration of the epithelial cells. Albumin is found in the urine, and often fatty and hyaline casts. There may be considerable dropsy. Renal insufficiency may supervene, and in such a case there is great risk of eclampsia if free excretion is not quickly re-established. The kidney condition clears up very quickly after delivery.

Nephritis.—Acute or chronic nephritis may be present during pregnancy. You have the usual indications. The condition will not clear up immediately after delivery. The albumin may lessen, but at least a trace of it will remain for a considerable time. Premature expulsion of the uterine contents is liable to occur, with or without convulsions. It is very difficult to distinguish the kidney of pregnancy from nephritis. In the latter, the history of the patient previous to impregnation may give you the clue, and if the albumin does not clear up within a very few days after delivery, you may definitely decide that the case is one of nephritis.

The following two cases may be taken as typical of the kidney of pregnancy:

Case I.—Mrs. C., 1-para, aged thirty-seven, was seen by me when seven and a half months pregnant, as she complained of headache which had been persistent for a day or two. I found œdema of the legs, body, and face, and the urine, on boiling, became solid with albumin. I at once ordered her to bed, gave her a large dose of salts, and put her on milk diet, with imperial drink and a diuretic mixture of acetate and citrate of potash. In a few days the albumin lessened very markedly, and very free excretion was established. She continued the diuretic and milk diet, and took a saline purge every morning, until labour came on. Once or twice I discovered a considerable amount of albumin in the urine, after she had surreptitiously indulged in meat diet. The labour was uneventful, and the albumin quickly disappeared from the urine.

I was very apprehensive that this patient would take fits before there was time to establish free diuresis, but she fortunately escaped. I doubt the possibility of this, had treatment been delayed a day or two.

This patient has passed through a second pregnancy without any albumin appearing in her urine.

Case II.—A primipara, single, aged twenty-four, eight months pregnant, complained of vertigo, transient loss of vision, and headache. There was marked œdema of the legs and face. The urine was found to be heavily loaded with albumin. She was put upon a diuretic mixture, and ordered to take milk diet and a saline purge each morning. As she was living in a " Home " she was not admitted to the hospital, but came back when labour had commenced. She disregarded the instructions which had been given her, and when she returned in labour all her symptoms were found to be aggravated. Two pints of saline (1 drachm each of acetate and chloride of sodium to the pint) were infused under the breast, and she was put on a diuretic after delivery. The labour ended naturally. The albumin disappeared from the urine a few days after delivery. It was a wonder that she did not take fits during labour.

The treatment of albuminuria, whether it be due to the kidney of pregnancy or to nephritis, is the same—viz., free purgation, the administration of diuretics, and a strict milk diet. In cases of nephritis, where the condition is known to be present before impregnation, an abortion or premature labour may have to be induced. In such cases one should not wait too long, but should empty the uterus before any urgent indications arise.

The subject will be dealt with more fully when treating of eclampsia.

ANOMALIES OF THE URINE IN PREGNANCY.

Polyuria is occasionally seen, and it may reach an astonishing degree. It is practically a condition of diabetes insipidus. The specific gravity of the urine is very low, but there is neither albumin nor sugar present. The patient experiences great thirst. After delivery the condition is relieved.

Treatment.—Except for the thirst the patient does not suffer, so no treatment is required. It would probably be unwise to attempt to diminish the excretion.

Glycosuria.—*Sugar* is sometimes found in the urine. Some observers say that it is present in 50 per cent. of the cases of pregnancy, but this is an absurd exaggeration. During lactation, sugar, in the form of lactose, is constantly found in the urine. This comes from absorption from the breasts, but it is of no consequence.

True Diabetes Mellitus may arise during pregnancy and disappear after delivery, but it may exist before impregnation. Its symptoms are liable to be aggravated by the pregnancy.

Prognosis.—It is a serious condition for both mother and fœtus. In a large number of cases the fœtus dies, and the woman frequently dies shortly after delivery.

Treatment.—The treatment should be the same as in a non-pregnant case.

Hæmaturia.—*Blood* in the urine may come from the bladder or the kidneys. From the bladder it may be due to acute cystitis, a vesical tumour, a stone, or vesical hæmorrhoids. In cases of eclampsia it is very frequently seen, and it does not necessarily mean that there is acute nephritis, as both the blood and albumin disappear from the urine very shortly after delivery.

Treatment.—If it is from the bladder, the cause must be removed. If it is from the kidneys, the treatment is the same as for eclampsia.

Acetonuria.—Acetone will be found in the urine when the fœtus is dead and macerated. It is a product of maceration. It disappears quickly after delivery.

Peptonuria.—This is sometimes found during pregnancy, but more commonly during the puerperium. In the latter condition it is a product of involution of the uterus.

Neither of these conditions requires any special treatment.

Pyuria.—Pus may arise from the bladder or the kidneys. This subject will be further dealt with when treating of cystitis and pyonephrosis.

Leucin and Tyrosin have already been mentioned as occurring in connection with acute yellow atrophy of the liver.

Renal Calculus.—During pregnancy the presence of a renal calculus may give rise to a considerable amount of suffering, and one may very easily be puzzled to account for the severe pain. When severe abdominal pain occurs during pregnancy, we naturally look for the source of the pain in the uterus, but it must not be forgotten that it may be in another organ altogether. The following case will illustrate this :

Case I.—A primipara, when about six months pregnant, was seized with paroxysmal pains in the right side of the abdomen. She was of a highly nervous, hysterical nature, and it was difficult to decide whether or not the pain was as excessive as she made out. She had never had attacks before. An examination revealed that the uterus was quiescent. The pulse and temperature were normal. The bowels were all right, and the urine had no blood in it. Large doses of morphia relieved the pain. She had one or two more seizures, but went to full time. Some time after delivery she brought me a phosphatic calculus which she had passed, and the mystery of the attacks of pain was solved. I must confess that I had not thought of a renal calculus at the time, as the urine seemed normal. At her next pregnancy the same thing occurred, and I of course knew what was wrong, and told her to be on the watch. She again passed a calculus some time after delivery.

Case II.—*A Renal Calculus with Pyo-nephrosis.*—About the sixth month of her fifth pregnancy a patient was seized with severe pain in her right side. When I saw her she was having a very violent rigor. Her temperature was 105° F., and her pulse very rapid. Her urine showed a considerable amount of pus. As I had recently seen the case of renal calculus just narrated, I at once thought this might be a similar one, accompanied by suppuration. The following history was obtained : In her early childhood she had passed blood in her urine for some time, off and on, until she was nine years old ; after that she had had repeated attacks of gravel, and was twice in the Royal Infirmary at the ages of thirteen and seventeen for treatment. When pregnant with her second child she had been seized about mid-term with very violent pain in the right side. Some time after delivery she had passed a " bramble " stone about the size of a bean. She described it as covered with spines. During her third and fourth pregnancies she had had similar attacks of pain, but had not passed any more stones. I attended her at her fourth confinement, but was not told anything about the painful attack. The labour was very quick, although the child weighed 11 pounds. From this history I concluded that she had a calculus, and that suppuration was taking place. Palpation of the kidney was impossible on account of the pregnancy. Pressure over it caused great pain. After the rigor passed off the acute pain lessened. I gave her quinine and Dover's powder, and the temperature soon fell. A few weeks later she had another attack of pain, but no rigor. She went to full time, and gave birth to another 11-pound child after a very quick labour. The kidney could now be easily palpated through the relaxed abdominal wall. It was very much enlarged, and seemed fluctuant to the feel. A few hours after labour the patient had a severe rigor, and the temperature rose to 103° F. She was again put on quinine and Dover's powder. She had a second rigor a few hours later. The temperature fell to normal on the third day of the puerperium, but on the fourth day it rose to 103° F., and she had a violent rigor. Her pulse was so weak that I gave her $\frac{1}{20}$ grain of strychnine hypodermically. There was no infection of the uterus, and the urine had not shown any amount of pus. I now determined to drain the kidney. I had purposely delayed this until the early days of the puerperium should be over. To delay longer seemed likely to end in disaster. On the morning of the fifth day Dr. Dalziel saw the patient with me, and confirmed my diagnosis. Her temperature was again normal. I passed a catheter and emptied the bladder of about a pint of pus. I could not feel any calculus in the bladder. We concluded that either the manipulations or the rigor had dislodged the calculus from the opening of the ureter, or else that the calculus had passed down. At all events, the abscess had partially emptied itself, so we decided to delay operating on the kidney until she had regained strength. From that time onwards she improved steadily. The pus very soon disappeared from the urine, and the kidney swelling lessened. Two months later I was anxious to have the kidney explored, but, as she felt quite well, she declined the operation. The calculus was never seen, and it may still be in the kidney, lying quiescent until she again becomes pregnant.

An exploration of this kidney would have definitely settled the question, but I think there can be little doubt that the diagnosis was correct.

This patient has passed through a sixth pregnancy without any renal pain.

The presence of renal calculi is said to predispose to abortion, but this has not been the case in any one of the six pregnancies of these two cases.

Treatment.—If the pain is not too severe, and the attacks are not frequent, you may temporize by giving morphia. If pus is present I think an operation should be done. In Case II. I think I erred in not insisting on this, but the patient was averse to it until after delivery. Unless there is urgency, the operation should be delayed until at least the second week of the puerperium.

Renal Tumours are exceedingly rare, but when they do occur they must be treated surgically, if necessary, irrespective of the pregnancy.

Floating Kidney.—The right kidney seems to be the one most frequently affected. It will not give rise to any trouble unless torsion occurs, or pressure upon it causes renal insufficiency. In rare cases the kidney has been found congenitally displaced, so that it lay at the brim of the pelvis. In such a case it would obstruct labour. In the curious cases of horseshoe kidney, or the union of the two kidneys, it has been found at the brim of the pelvis, and in such a case it would prove a very serious obstruction to labour.

Cystic Disease of the kidneys is sometimes found. If this is very marked, fatal eclampsia is likely to occur, if there is not sufficient renal substance left to carry on the work of excretion.

Hydro-nephrosis.—This condition may occur from pressure of a displaced uterus on the ureter. It might also occur if a renal calculus were to block the ureter. The uterus should be replaced to relieve the pressure.

Pyo-nephrosis has already been referred to in Case II., p. 33. This condition was also present in the case of purpura hæmorrhagica, p. 42. An abscess behind the kidney, but not involving its substance, is also recorded on p. 433.

An abscess in the kidney or behind it should be treated in the ordinary way—by incision and drainage.

Bladder Complications.—Irritability of the bladder is very common, especially in the earlier and later months of pregnancy. Micturition is very frequent, and causes considerable annoyance. Very nervous women are specially liable to it. It is caused by pressure upon the bladder.

Treatment.—As a rule no treatment is necessary, but nerve sedatives, such as bromide and belladonna, or hyoscyamus, may be given if required.

Incontinence and Retention of Urine.—True incontinence is occasionally seen during pregnancy, but in the vast majority of cases where there is a constant dribbling of urine, it is not due to incontinence, but to the very opposite condition—viz., *retention*. The supposed incontinence is merely an overflow from an overdistended bladder. This condition arises in the third and fourth months of pregnancy, and is caused by a backward displacement of the uterus. A retro-displaced pregnant uterus will not at first cause retention of urine, but during the third month it will have increased in size, sufficiently to press the cervix against the neck of the bladder, and prevent the emptying of that organ. The bladder will soon become distended, and, if an overflow does not begin, rupture will inevitably occur. This has happened ; but fortunately, in the great majority of cases, dribbling of urine begins and the bladder is saved. When the constant dribbling begins the patient naturally supposes that she is passing plenty of urine, and will be sure to make that assertion. A careless attendant may be misled on hearing such a statement, and imagine the case is one of incontinence. It is really surprising how often this mistake is made. In every case of dribbling of urine, especially in the early months of pregnancy, it should be constantly borne in mind that it is far more likely to be a case of retention than of incontinence.

Diagnosis.—If it is incontinence the bladder will be empty, and if it is retention it will be full. A full bladder can be diagnosed by abdominal palpation, or by passing a catheter.

Treatment.—*Incontinence* should be treated by rest and tonics. Nux vomica will strengthen the sphincter.

Retention.—The first thing is to relieve the bladder by passing a catheter. This must be done with the strictest aseptic precautions to prevent cystitis. If the bladder is very much distended care must be taken not to empty it completely, or serious hæmorrhage may occur. If the urine is septic it should all be drawn off, but some boracic solution should be injected. The subsequent treatment of the case will be fully dealt with under the heading of Retro-displacement of the Gravid Uterus. When the uterus is replaced there will be no further difficulty of micturition.

Vesico-Vaginal Fistula.—A fistula may be present, and it would give rise to constant dribbling of urine. Its cause, diagnosis, and treatment, will be fully dealt with under bladder complications of the puerperium.

Vesical Calculi.—These are occasionally found in pregnant women. The signs and symptoms are the same as in the non-pregnant, only they may be aggravated by the pregnancy.

Treatment.—They should be removed through the urethra or by vaginal lithotomy, before labour comes on. A fairly large stone would cause considerable obstruction during labour, and a vesico-vaginal fistula would probably result. If the diagnosis were made early in pregnancy, it would be advisable, if possible, to delay the operation until after the seventh month, so that, if labour came on as a result of the operation, there would be a good chance of the child surviving.

Cystitis.—This condition is much more common during the puerperium, but may arise during pregnancy. It may be due to gonorrhœa.

The usual signs and symptoms of cystitis are present—viz., frequency of, and painful, micturition. The urine will usually contain more or less pus, and it may be very septic, as in Case II., p. 75.

Treatment.—Alkalies combined with hyoscyamus, belladonna, and buchu. In aseptic cases boracic acid internally is very useful. Urotropin is also useful in these cases. The bladder should be washed out at least once a day with boracic solution. The patient should be given barley-water and other diluent drinks freely. If there is much pain morphia should be given. In a chronic case like the following, the bladder may become very much contracted.

CASE.—The patient, a multipara, was fully eight months pregnant when admitted to the hospital. During the whole of the pregnancy she had suffered from frequent micturition with severe pain. She said that for weeks she had scarcely slept at all. The urine seemed quite normal to the naked eye, but contained a very faint trace of albumin. She had been under treatment all the time, taking alkalies, buchu, and hyoscyamus, and also urotropin, but had got no relief. The bladder had not been washed out.

When we attempted to wash it out we found that at first it would not admit more than an ounce of boracic lotion, and would contract on that and force it back into the raised funnel. The bladder was washed out twice daily, and the patient was given morphia for the pain. After a few days, more fluid could be got into the bladder, and the patient felt much more comfortable. Labour came on about a week later, and a premature live child was born. The bladder then quickly increased in size, and by the time the patient left the hospital it would hold from 6 to 8 ounces, and she could retain her urine comfortably for several hours. The cause of the cystitis we could not definitely ascertain. There was no indication of gonorrhœa.

CHAPTER V

COMPLICATIONS OF PREGNANCY—*Continued*

Diseases of the Blood—Anæmia—Pernicious Anæmia—Scurvy—Purpura Hæmorrhagica—Hæmophilia—Diseases of the Cardio-vascular System—Varicose Veins—Phlegmasia Alba Dolens—Thrombosis—Aneurism—Heart Disease.

DISEASES OF THE BLOOD.

AT one time a condition of plethora was believed to exist in pregnancy, and as a consequence lowering remedies and often bleeding were frequently resorted to. For the last twenty years or so an entirely opposite opinion has been held. Careful analyses of the blood have shown that a very different condition from plethora exists. The total amount of blood is increased to supply the enlarged vascular arrangements of the uterus. The increase is in the watery elements—*i.e.*, there is a condition of hydræmia. The red corpuscles are materially diminished, the albumin in the serum lessened, but the fibrin and extractive matter increased. The increase of fibrin explains why thrombosis is so liable to occur during pregnancy. The condition is thus seen to be one more nearly approaching that of anæmia than of plethora. It is not exactly a condition of anæmia, however, as although there is a diminution of hæmoglobin, this is not from impoverishment of the individual cells, but simply from dilution by the increase of the watery element of the blood. The leucocytes are considerably increased in number. During the first nine or ten days after delivery, the red corpuscles increase in number, and the hæmoglobin in quantity, while the leucocytes diminish in number.

Dr. Carstairs Douglas has tested the coagulability of the blood in pregnant and parturient women, and his results show that it is much the same as in the non-pregnant.

Anæmia.—While true anæmia is not usual in pregnancy, it occurs in a good many cases. It may have been present before, or it may have arisen during the course of the pregnancy. It may be associated with nephritis, cardiac disease, pernicious vomiting, or any constitutional disease, such as phthisis. In some cases it may be so marked as to lead one to suppose it to be the pernicious form.

The patient will show all the usual indications of anæmia. There may be considerable œdema.

Treatment.—Iron and arsenic should be freely administered, the bowels kept open, and plenty of good nourishing food taken. Post-partum hæmorrhage should be rigidly guarded against, as the patient can ill afford to lose any blood.

Pernicious Anæmia.—Fortunately this condition is rarely seen with pregnancy. When it does occur it is usually fatal to both mother and child. It may arise during the puerperium after severe post-partum hæmorrhage, especially after repeated attacks of secondary hæmorrhage.

Treatment.—Iron and arsenic, especially the latter, should be freely administered, and if there is no improvement the uterus should be emptied as soon as possible. If, however, the patient is very weak, the operation should not be undertaken, for it will only hasten the end.

The following two cases were treated in the Maternity Hospital within a few weeks of each other:

CASE I.—Mrs. B., 5-para, aged twenty-seven, was admitted in a state of extreme anæmia with marked lemon-yellow tint of the skin. During her former pregnancies she had been extremely pallid, but she had never before shown any yellow discoloration of the skin. Until a fortnight previous to admission she had been able to perform her usual household work, but at that time she had begun to suffer from shortness of breath and weakness. Almost continuous vomiting had come on, and she had noticed the yellow colour of her skin. She had consulted a doctor, who had diagnosed enlargement of the liver. Some days before admission her urine was observed to be very dark in colour and almost opaque.

The patient had had rheumatic fever seven years before.

On admission the os was found to be the size of half a crown. The fundus uteri reached two-thirds of the way up to the ensiform cartilage. The patient was well nourished, the skin soft and smooth, but of a lemon-yellow tint, more marked over the flexures of the various large joints. The lips and buccal mucous membrane were bloodless, but somewhat blue, as also her forehead. The pulse-rate was 126, and respirations 44 per minute, laboured, but not noisy.

The area of cardiac dulness was enlarged, but the heart sounds were pure, though somewhat weak. The area of hepatic dulness was increased in an upward direction. No fœtal heart sounds could be heard. She had felt no movement for four days.

The patient was so collapsed that no attempt was made to deliver her. She was freely stimulated, but gradually sank and died undelivered.

Post-mortem Examination.—The body surface presented a greenish-yellow hue, most marked over the flexures of the joints. The subcutaneous fat, which was abundant, also presented the same colour.

Heart.—The pericardium contained 4 ounces of opaque greenish-yellow fluid. The cavities were all occupied by ante-mortem clots, which extended into all the vessels. That in the right auricle showed evidence of some duration in the shape of stratification. The fibrous layer overlying the clot was greenish in colour. The cardiac muscle was pale, and in the right ventricle, both internally and externally, showed the mottling of extreme fatty degeneration. A similar condition was visible only in the papillary muscles of the left ventricle; the muscular substance of this ventricle had a reddish-brown appearance, but sections parallel with the surface showed yellowish mottling apparently from fatty degeneration. The valvular structures appeared normal, except for very slight thickening of the corpora aurantii of the aortic curtains, and along the free margins of the mitral.

Lungs.—The pleural cavities contained a few ounces of fluid. The lungs were not adherent, but both very œdematous at their bases.

Spleen.—It was greatly enlarged, measuring 6½ inches by 5¼ inches by 2 inches. Its anterior margin was considerably notched, and there was a transverse groove across the convexity. Its substance was almost diffluent and of a chocolate colour.

Liver.—It was considerably enlarged and very pale. It measured 11½ inches by 7½ inches by 3½ inches. Its cut surface had a peculiarly waxy-looking, pale yellowish-brown colour; the central parts of the lobules were considerably darker than the peripheral.

Uterus.—The gravid uterus was removed with the bladder and rectum. No abnormality was detected, except a general greenish-yellow colour. The uterus measured 10 inches by 6¾ inches by 5 inches.

Kidneys.—Both ureters were slightly dilated. There was nothing abnormal in either of the kidneys or suprarenal glands.

Stomach and Intestines.—The stomach showed no ulceration. The bloodvessels of the jejunum were engorged, and at several points there were groups of minute hæmorrhages.

Bone Marrow.—The peripheral part of the marrow of the femur at its lowest end was of a dull chocolate colour, the centre maintaining its normal colour. Higher up the shaft it was all transformed into a diffluent dull red substance.

CASE II.—Mrs. S., 4-para, aged twenty-seven, was admitted to hospital in an extremely anæmic condition about the middle of the ninth month of her fourth pregnancy.

A fortnight after her second confinement she had been admitted to the Royal Infirmary suffering from anæmia. There was no history of post-partum hæmorrhage. She was dismissed well in a month. Some months after the birth of her third child she had again been treated in the Infirmary for the same complaint. That time the hæmoglobin had been found to be 25 per cent., and the red corpuscles 800,000 per cubic millimetre. After a month's treatment she had been dismissed well.

Since then for about a year she had enjoyed good health, until about three weeks before admission, when her skin became pale and then yellow. Her breath became very short, and she was unable to do her usual household work.

On admission her skin was of the yellow colour of extreme anæmia, and the lips and buccal mucous membrane bloodless. Her speech was slow and hesitating, but her mind seemed quite clear. There was marked tremor of the hands when she held them up. With the exception of reduplication of the second, and want of definition of the first sound, especially over the mitral area, nothing abnormal was found in the heart.

Per vaginam the fœtal head could be felt through the os, which was about the size of a shilling. The fœtal heart sounds could not be heard. There was a faint haze of albumin in the urine, but no sugar or casts.

It was decided that any attempt to deliver her would only hasten the end, so beyond free stimulation nothing was done. She died about twenty-four hours after admission. Post-mortem Cæsarian section was at once performed, but the child showed no indications of life. It was not macerated, and was well developed.

No post-mortem examination was allowed.

The rapid termination of the disease in both these cases is somewhat remarkable. In neither did any grave symptoms arise, until within three weeks of death.

Scurvy.—In large cities like Glasgow, cases of scurvy are occasionally seen, especially during bad times. The disease arises from improper feeding. It manifests itself in the usual way by sponginess of the gums, which bleed profusely when touched, and subcutaneous hæmorrhage in different parts of the body.

Treatment.—A liberal fresh diet is all that is necessary.

CASE.—A multipara was admitted to the hospital in labour at full time. She was very weak, and had evidently been on starvation diet for some time. Her mouth was in a filthy condition, the gums soft and spongy. A number of subcutaneous hæmorrhages were found in both legs. The labour terminated naturally, and there was no post-partum hæmorrhage.

She was treated with an antiseptic mouth wash and a liberal diet, and in a few days the scurvy disappeared. The child showed no evidence of the disease, but it was feeble, and died in a day or two.

Purpura Hæmorrhagica.—This is a very rare complication of pregnancy, but when it does occur it is generally fatal. It may arise any time during the pregnancy or after delivery. The fœtus is likely to be destroyed, and if it is born alive it may show the disease. The pregnancy will probably be interrupted.

The disease manifests itself by hæmorrhages from the various mucous membranes of the body and under the skin. The bleeding may be so great as to cause profound anæmia and the death of the patient. Post-partum hæmorrhage is very apt to occur, and has proved fatal in a number of cases. The risk of sepsis is very great. During the puerperium metrorrhagia may occur and prove fatal.

Diagnosis.—The only disease it might be mistaken for is scurvy. In the latter the history of improper diet gives the clue.

Prognosis.—This is exceedingly grave for both mother and fœtus.

Treatment.—Arsenic should be given freely. In the following case I used suprarenal tabloids, and although the patient died the purpuric condition certainly improved:

CASE.—*Purpura Hæmorrhagica and Pernicious Vomiting of Pregnancy.*—Mrs. W., aged nineteen, was admitted to the Glasgow Maternity Hospital on June 14, 1901, suffering from persistent vomiting, which had first commenced in January, but had been much more severe since the latter end of May. She stated that she had rejected everything except a little water since about May 28. She considered herself in the seventh month of pregnancy. Her health previous to this pregnancy had been excellent. She had had two abortions, one nearly four years ago, and the second in July, 1900. They had both been about the third month. She could give no cause for them.

On admission, she looked collapsed, sallow, and emaciated. Judging from her rings, her fingers were much thinner than formerly. Her pulse was about 120, regular, and of fairly good tension; temperature, 99° F. The heart sounds were normal, and the fœtal heart could be distinctly heard. The abdomen was not much distended. The fundus was slightly above the umbilicus. There was no œdema of the legs. The urine was very scanty, dark coloured, muddy, with a peculiar sweetish odour. It contained a distinct trace of albumin, pus cells, epithelial débris, and some granular tube-casts.

A sip or two of egg-flip and brandy was given, but it was immediately rejected. Rectal feeding with milk, brandy and beef-peptonoids was at once commenced. The enemata were retained. Next day she was given 10 grains of oxalate of cerium and 15 grains of bismuth subnitrate three times, but she rejected the first two doses. As she was excreting very little urine, 25 ounces of saline solution were infused under the right breast. That evening her temperature, which had been subnormal since the day after admission, rose to 101·4° F., but fell to 97·8° F. next morning. On the evening of the 18th, it rose to 103° F., but it quickly fell to normal again. By the 19th she had improved considerably. The sickness had nearly ceased, and she was able to take imperial drink, milk and lime water, and brandy and ice by the mouth and retain it. The fœtal heart sounds could not be heard.

On the 20th, a distinct rash began to appear about the extensor surfaces of the elbows, hips, and knees. It quickly became purpuric and general in character. The gums, also, began to bleed readily. Hæmatemesis began on the evening of the 21st, and feeding by the mouth was stopped. The pulse became much weaker, and tremor of the hands was noticed. Her face became cyanosed, and she appeared to be drowsy.

Dr. Carstairs Douglas tested the coagulability of the blood, and found that the time was ten and a half minutes. This is about double the ordinary time. He found urobilin in the urine. She was now put on suprarenal tabloids, 5 grains three times a day.

June 23.—Hæmatemesis occurred twice during the night. Hypodermic injections of 5 minims of liq. strych. were given every six hours.

June 24.—To-day there was a slight vaginal discharge, and on examination the os was found partially dilated. Labour was going on, but the patient maintained that she felt no pain. She, however, felt the vaginal examination. In a few hours a dead fœtus was delivered by the breech.

There was no post-partum hæmorrhage, but as a preventative an intra-uterine douche of 2 pints of water, containing 30 grains suprarenal extract to the pint, was given, and a hypodermic of ergotin and strychnine. Two pints of saline solution were infused into the abdominal wall. The pulse was very feeble and rapid. The fœtus did not show any eruption, and there were no hæmorrhages into the placenta.

June 25.—Vomiting recurred several times; hiccough at intervals; pulse almost imperceptible. She lay with half-closed eyes, but when spoken to said that she felt much better. The rash had faded very much. Muscular tremor was very marked. Strychnine injections were stopped, and ether used instead. She died at 10.45 p.m. For the last hour she was unconscious, and the breathing was Cheyne-Stokes in character.

We were fortunately able to obtain a post-mortem examination. Dr. Carstairs Douglas reports as follows:

"Body fairly nourished; sallow and jaundiced tint of skin. *Rigor mortis* gone in arms, present in legs. Pupils equally dilated.

"On reflecting the skin, the tissues were found to be very dry. Fair amount of subcutaneous fat.

"*Thorax.*—Heart covered all over anterior aspect with fat; pericardium normal. Moderate amount of dark fluid blood in right side. Every chamber occupied by ante-mortem firm, pale clot, extending up into aorta and pulmonary artery. Left lung very distinctly emphysematous. Right lung emphysematous in upper lobe, solidified in lower lobe.

"*Abdomen.*—Stomach distended with gas, and containing about 10 ounces of black fluid (blood). Mucous membrane greenish-yellow in colour, and a few small pinkish spots seen here and there. No ulceration. Gullet and duodenum contained similar material, but no ulcers or bleeding points. Liver large, firm, and heavy. Slight degree of nutmeg changes; gall-bladder distended. A subsequent examination of the liver and kidneys gave evidence of a deposit of iron similar to that seen in pernicious anæmia.

"*Spleen.*—Small, normal.

"*Pancreas.*—Small, normal.

"*Left Kidney.*—Fairly normal, some small bluish-black points in surface of cortex, and old hæmorrhages. Cortex pale, medulla normal. Left suprarenal appeared normal. *Right kidney* has an abscess in its pelvis containing thick, yellow pus. The abscess burrows to a moderate extent into the substance of the organ. Suprarenal appears normal.

"*Bladder.*—Contains a little brownish urine; surface normal.

"*Tubes* and *ovaries* healthy. Corpus luteum on the right side.

"*Uterus.*—Well contracted; wall pale and thick; decidua entirely away; a little blood-clot present."

The post-mortem examination did not throw much light on the subject as to the cause of the disease. The small abscess in the kidney can hardly be considered as a cause.

The observation on the coagulability of the blood is interesting. In Fagge's "Medicine" it is stated that "it (the blood) has been said to be deficient in coagulating power, but this seems to be a mistake." In this case there certainly was a marked deficiency. Unfortunately we were unable to make a second observation after the patient had been taking suprarenal extract.

The disease is one of the blood, and I do not think that pregnancy has any share in causing it; the increased amount of fibrin in the blood should rather act as a preventative, and this fact probably accounts for its infrequency in pregnancy. What part, if any, the pernicious vomiting played in causing the disease I cannot say, but it undoubtedly caused the patient's death, as the purpuric condition had improved very much.

I would have induced labour for the vomiting when she was admitted, if I had thought she could stand the operation. Rectal feeding was first tried to see if we could strengthen her a little, and she undoubtedly did gain strength, but when the purpura manifested itself I felt that induction would only hasten her end. The result proved the correctness of this view.

It is interesting to note that no post-partum hæmorrhage occurred. This may have been due to the effect of the suprarenal extract. The painless nature of the labour was another interesting feature. A case of painless labour in connection with pernicious vomiting has already been referred to on p. 20.

Hæmophilia.—This condition, fortunately, usually skips the females in a family of bleeders. It would be a very serious complication of pregnancy, and especially of labour. An abortion would be very likely to occur, and it might easily prove fatal from hæmorrhage. One occasionally meets with cases where a very large amount of bleeding habitually occurs, after abortions or labours, in women who may be classed as habitual bleeders, but they can hardly be said to suffer from true hæmophilia.

Treatment.—A woman suffering from hæmophilia should be strongly advised not to marry. The administration of suprarenal extract, or chloride of calcium, would probably do good. The uterus should be firmly plugged as soon as emptied, either after an abortion or full time labour.

COMPLICATIONS CONNECTED WITH THE CARDIO-VASCULAR SYSTEM.

Varicose Veins.—These are exceedingly common, especially in multiparæ. The veins of the legs and thighs are those chiefly affected, but the labial ones may also show the condition in a marked degree. In the broad ligaments the same condition exists in most cases, and frequency of hæmorrhoids has already been referred to, and the same condition may exist in the bladder.

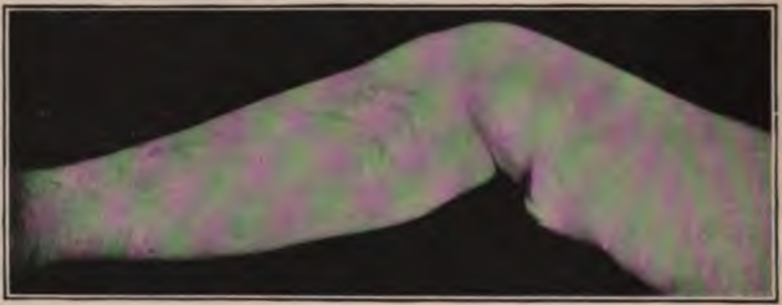


FIG. 1.—VARICOSE VEINS OPERATED UPON DURING PREGNANCY.

The legs are very apt to become swollen, and phlebitis may occur. If by any chance one of the veins should be injured, the woman may very easily bleed to death in a few minutes, if prompt measures be not taken to check the hæmorrhage. An injury to the vulva may also give rise to very profuse bleeding.

Treatment.—The legs should be kept bandaged while the patient is on her feet, and she should rest as much as possible. She should be warned to guard against injury, and should be told how to apply pressure if a vein should be ruptured. In a bad case operation during the pregnancy may be necessary, but if possible one should avoid this.

If the veins become inflamed, the patient should be kept strictly in bed, and have sedative applications, like lead and opium, or belladonna, applied to the parts.

Case.—Mrs. C., 2-para, aged thirty-two years, eight months pregnant. In her first pregnancy Mrs. C. had suffered from very bad varicose veins in the legs, especially in the right one. I attended her at the confinement, and strongly urged upon her the advisability of having the veins operated upon before she should again become pregnant; but she unfortunately delayed too long. In her second pregnancy the condition was aggravated, and when I saw her at the eighth month I found the veins of the right leg were very much distended, especially behind the knee and a short distance up the back of the thigh (Fig. 1). The upper clump of veins showed distinct inflammation, and looked as if it might burst at any moment. I had her removed to hospital, and she was there seen by Professor Henry E. Clark, who dissected out all the most prominent veins in the right leg and thigh. Clotting had occurred in the large upper mass, and in some of the lower veins. The parts healed by first intention.

Immediately after the operation the fœtal heart could not be detected, although it had been quite distinct before. Next day a careful auscultation failed to reveal it, and the patient said she could not be sure of movements; but on the second day it was quite distinct, and movements were active. I was afraid that the fœtus had died from chloroform poisoning. On two occasions I have delivered dead children where the deaths seemed to have been due to chloroform administered to the mothers.

Phlegmasia Alba Dolens may arise during pregnancy, but it is more apt to occur during the puerperium. It will be discussed when dealing with the complications of the puerperium.

Thrombosis may arise when the veins are inflamed, and if a piece of clot becomes detached an embolus may be carried on into the lungs. During the puerperium this occasionally occurs and may cause sudden death.

An embolism or a hæmorrhage in the brain may occur, and cause hemiplegia, but we shall consider this under the nervous system.

Aneurism.—An aneurism is a very serious complication of pregnancy, especially of labour, as the great strain thrown upon the circulation would be very apt to cause rupture.

Treatment.—The usual treatment of aneurism would have to be adopted, and when labour comes on the patient should be delivered artificially as soon as the os dilates, so as to avoid the straining during the second stage.

Heart Disease.—Under ordinary conditions heart disease in any of its forms is a very serious complaint. When it occurs in pregnancy, or when, as is more usual, pregnancy occurs in a patient with old-standing heart disease, the gravity of the condition is very great.

In pregnancy an extra amount of work has to be done by the heart, to supply the wants of the uterus. When the heart is healthy, Nature easily provides for this by a certain amount of hypertrophy, especially of the left ventricle, as it is on it principally that the extra strain falls. If the heart is diseased in a non-pregnant woman, as in a man, Nature tries to remedy matters by a compensatory hypertrophy, and the patient may go on fairly comfortably for years, so long as the compensation is sufficient. If, however, the woman becomes pregnant, the extra strain thrown on her circulation is very likely to upset the arrangement, and failure of compensation and its attendant evils will follow. The patient suffers from breathlessness, palpitation, and cough. Œdema of the legs and body will come on. The lungs will also become œdematous, and bronchitis or congestion follow, so that the patient cannot lie down. She may put up considerable quantities of blood in her sputum. The kidneys will also be affected, so that albumin will be found in the urine. Bad symptoms do not as a rule manifest themselves until after the fourth month. Previous to that time the strain upon the circulation has not been too great for the heart, but from then onwards it gradually increases until it reaches its maximum during labour, when the overworked organ may give out, and the patient die suddenly. In many cases the pregnancy ends prematurely. The accumulation of carbonic acid in the blood is liable to cause uterine contractions.

Diagnosis.—This is made in the usual way by the detection of the murmurs. The cardiac area will usually be increased, and the position of the apex beat displaced outwards. A very slight blowing systolic murmur may often be detected at the apex, but this may not indicate any disease. A certain amount of dilatation of the heart occurs in pregnancy, and this, by stretching the valves, may allow of a certain amount of regurgitation, but it is of no consequence, as it will disappear after delivery. In anæmic cases soft blowing hæmic murmurs must not be taken as indicating cardiac disease, but on the other hand it must not be forgotten that very bad anæmia sometimes accompanies the disease.

Prognosis.—It is a serious condition, but not nearly so hopeless as Macdonald and others have maintained. The greatest risk arises during or shortly after delivery, but this will be treated of later, when dealing with labour in cases of cardiac disease.

Treatment.—If sufficient compensation can be maintained during pregnancy the patient will do well. To maintain compensation, cardiac tonics are generally necessary, but one occasionally sees a case where they are not required. In most cases tonics should be given during the latter half of pregnancy. Strophanthus is a pure cardiac tonic, and is therefore more suitable than digitalis. In the majority of cases, treatment is called for when failure of compensation has manifested itself. When the lungs are involved, carbonate of ammonia combined with the cardiac tonic is very useful. If there is much dropsy one may use a diuretic with the cardiac tonic. The patient should be kept at rest in bed. If no improvement occurs, it may be necessary to empty the uterus, but there is considerable risk in doing this, as the strain of labour may only hasten the end. In bad cases premature labour is apt to occur spontaneously. If at a previous confinement the patient has nearly died, it will be advisable to empty the uterus by inducing an abortion before the end of the third month, as was done in Case V. The strain does not begin to tell upon the heart until about the fourth month, therefore the operation should be done early in the pregnancy.

CASE I.—*Aortic Incompetence ; Premature Labour.*—Mrs. C., aged forty-two, multipara, came to me complaining of cough, breathlessness, and swelling of the legs. She had had five children, one still-born, and three abortions. After her first confinement, twenty-two years ago, she had had rheumatic fever. On examining her chest, I found bronchial râles all over the lungs and evidence of œdema at the bases. There was marked pulsation in the carotids. At the base of the heart a blowing diastolic murmur was heard, well conducted down the sternum. At the apex there was no murmur to be heard. The apex beat was displaced outwards, but as she was a very stout woman, it was impossible to make out the exact size of the heart by percussion. Menstruation was regular. The bronchitis soon yielded to treatment, and I then put her upon Easton's syrup.

A short time after this menstruation ceased, and at first she ascribed this to the menopause ; but, as morning sickness began, I examined her and found that she was pregnant. I then put her upon strophanthus. She did fairly well until the seventh month, when œdema of the legs returned, and breathlessness became very bad. The propriety of inducing labour arose, but I was loath to do this. My difficulty was solved by premature labour coming on of itself. The labour was fairly quick, and the strain upon her system not very great. The child was still-born. There was a considerable amount of post-partum hæmorrhage, but not excessive for such a plethoric woman. She made a good recovery.

CASE II.—*Mitral Incompetence; Great Œdema of the Legs, Body, and Lungs; Labour at Full Time.*—The patient was a multipara about forty years of age. She had had heart disease for a good many years, and several times had been very dropsical. When first seen she was within a few weeks of full time. She was propped up in bed panting for breath. The legs, body, and face were very œdematous, and her lips were quite blue. She had a very troublesome cough, and was spitting up bright blood. Her pulse was very quick and irregular. The heart was greatly dilated. There was a loud systolic murmur at the apex, conducted round into the back. The lungs showed evidence of extreme engorgement.

Her condition seemed very critical, but after a few days' treatment with digitalis, carbonate of ammonia, and senega, she improved very much, and could lie down. She went to full time. One night she got out of bed to get a drink of water, and while crossing the floor the child was suddenly expelled by a single pain. The cord broke a few inches from the umbilicus. The child was alive, and showed no evidence of injury. The patient was at once put back to bed, and the placenta came away naturally. She made a good recovery. The child developed congenital syphilis and died in a few weeks.

Twice afterwards I treated this woman for failure of compensation, but she was never again pregnant. She died about four years after the confinement, but not under my care.

CASE III.—*Mitral Stenosis; Labour at Full Time.*—Mrs. McA., aged thirty-five, consulted me in 1894 to see if there was anything wrong with her to prevent her becoming pregnant. She had been married some years, and was very much disappointed that she had not had a child. She had had rheumatic fever three times, and on examining her heart a very loud, rough presystolic murmur was heard at the apex. The thrill could be distinctly felt. Her pelvic organs appeared to be normal. I told her that she ought to be thankful that she had never been pregnant, and that for her sake I hoped she never would become so.

About a month later she had a very bad attack of breathlessness, and began to cough up blood. I found her propped up in bed. Her lips were very blue. The base of both lungs showed marked œdema, and as her temperature was up I was afraid it would end in a double pneumonia. Mustard poultices were applied, and she was put on large doses of carbonate of ammonia and digitalis. She was much relieved in a few hours, and made a good recovery.

A few months later she came to tell me that menstruation had ceased for two periods. She said she had no sickness, and was feeling perfectly well. She had had one or two attacks of breathlessness since her illness, but had taken some digitalis and ammonia, which had quickly freed her from this symptom. I found she was pregnant, and although I had told her of the great risk she ran, she was quite pleased at the prospects of having a child. I advised her to take strophanthus in tabloid form—2 minims three times daily during the whole pregnancy. She went to full time without a day's sickness, and said that she had never enjoyed better health. Only once or twice did she have any breathlessness.

When labour set in I gave her a large dose of strophanthus. In about six hours from the onset of labour, when the os was nearly fully dilated, her breathing began to be embarrassed, and her lips became blue. I had sent for assistance, but her condition became so bad that I took the risk of giving her chloroform alone, and applying the forceps after fully dilating the cervix. The child was alive. After the placenta came away she bled freely, and I allowed her to do so. The pulse, which had been 56 before delivery, rose to 112. An hour after delivery I gave her 5 minims of strophanthus, and during the night she had 4 minims every three hours. She made an excellent recovery. The cardiac tonic was continued during the puerperium.

CASE IV.—*Mitral Stenosis ; Labour at Full Time.*—Mrs. B., aged twenty-four, 2-para, was admitted to the Glasgow Maternity Hospital on March 13, 1899, complaining of cough, breathlessness, and swelling of the legs and feet of six weeks' duration.

Three years ago, prior to marriage, the patient was in the Royal Infirmary of Glasgow under treatment for an attack of acute rheumatism. She was married two years ago, and one year ago she had her first child. Whilst she was carrying the first child she suffered a good deal from swelling of the feet, breathlessness, and cough, but not to such a marked extent as on the present occasion. The patient stated that for the last six weeks she had been quite unable to lie down at night, on account of her breathlessness. She calculated that she was about seven and a half or eight months pregnant.

Condition on Admission.—Patient was pale and anæmic looking. There was well-marked œdema of the lower limbs—more marked on the right side—also over the sacrum. There was no swelling or œdema of the face.

There was a troublesome cough and marked dyspnœa, with a tendency to cyanosis, but no spitting of blood. Examination of the lungs showed impairment of resonance at both bases, together with weakened respiratory murmur and a few fine râles. There was nothing at the apices.

Heart.—Marked impulse just within the nipple-line. On palpation a well-marked presystolic thrill could be felt. On percussion, the area of cardiac dulness extended on the left to 3 inches to the left of the midsternal line, on the right to the midsternal line, and above to the lower border of the third costal cartilage. On auscultation a well-marked presystolic murmur, followed by a very rough first sound, could be heard. Over the pulmonary area there was well-marked reduplication of the second sound.

The fœtal heart-sounds were audible. During her stay in hospital we frequently failed to hear the fœtal heart-sounds for days at a time, and yet the child was alive.

The patient's urine contained a trace of albumin.

She was put upon tr. strophanthus (10 minims), caffein citrate (2 grains), and pot. iodi. (5 grains) every four hours. In a few days the swelling of the limbs and trunk had disappeared, the cough and breathlessness were gone, and the patient could lie down. The albumin had disappeared from the urine. She remained well until April 23, when labour set in. The os dilated rapidly, and as soon as the first stage was completed chloroform was given, and delivery effected by forceps. There was no post-partum hæmorrhage. She made an uninterrupted recovery. The child, a female, was alive.

CASE V.—*Mitral Stenosis and Incompetence; Induction of Abortion at the End of the Third Month.*—Mrs. C., a multipara, had suffered from heart disease for a number of years. She had had repeated attacks of breathlessness, palpitation, etc., and at her last full-time confinement had very nearly died. Dr. Carstairs Douglas, who had attended her, was of the opinion that she could not stand the strain of another labour, and he had induced an abortion at the third month about two years ago. Dr. Taylor, of Skelmorlie, sent her to me for induction of an abortion.

She was three months pregnant. Her heart was considerably dilated and irregular, and quick in its action. At the apex a presystolic and a systolic murmur were heard. Considering her past history, I agreed that an induction of an abortion was the best treatment.

The patient was prepared for the operation by the administration of a purgative. On the following day, after thoroughly cleansing the external genitals and douching the vagina with lysol solution, I passed a sterilized sound, and moved it about freely in the uterus. Two days later uterine action began. About mid-day the patient was seized with a very violent rigor, which lasted for fully five minutes. Her temperature rose to 105° F., and her pulse became so rapid that it could not be counted. I at once stimulated her freely, and gave her 10 grains of quinine. She had several very severe rigors in a short time, and then the uterus emptied itself. Everything came away, and seemed perfectly fresh. I gave an intra-uterine douche. The stimulation was continued, and, in addition, a large dose of calomel was administered. There were one or two rigors after the uterus was emptied, and the temperature remained at 105° F. until the bowels moved, about four hours later. She passed a very large quantity of horribly offensive fæces. The stench was so overpowering that the nurse had to open all the windows and doors. In a short time the temperature fell, and in twelve hours it was normal. It never rose again, and she made a good recovery. She has since died from heart disease.

The rigors and high temperature puzzled me at the time. I had taken every precaution against sepsis, but if she had died before the bowels moved I would never have been able to get rid of the feeling that in some way or other I had infected her.

It was clearly a case of auto-infection from the contents of the bowels. I have occasionally seen cases of this during the puerperium, but never such an alarming one. The purgative given before the operation had caused a motion, but had not cleared the bowels. The curious thing was that the patient denied that she had been specially constipated.

CASE VI.—*Mitral and Tricuspid Incompetence; Labour at Full Time.*—Mrs. McM., aged twenty-seven, 4-para, was sent into the Glasgow Maternity Hospital by Dr. George Turner. There was extensive œdema of the legs, and especially of the vulva. There was also some swelling of the face. Both lungs showed evidence of œdema at the bases behind. A soft systolic murmur was audible in the mitral area, and a sharper, high-toned one in the tricuspid area, also systolic. The position of the apex beat could not be made out, neither could the exact size of the heart be determined, as the lungs were evidently emphysematous. Bronchitic râles were heard all over the chest. The urine contained a trace of albumin.

The patient was markedly anæmic. She stated that she had been breathless for a considerable time, and that the legs had been swollen for a few weeks. The swelling of the vulva had only come on within the last few days. She considered that her labour was due in a few days. The labia were punctured and allowed to drain into sterilized dressings, and tr. strophanthus (10 minims) and am. carbonate (5 grains) given every four hours.

She improved considerably, and four days later labour came on. The first stage lasted about four hours. At the end of it she began to show cardiac embarrassment. The pulse became weak and irregular. She was given a hypodermic injection of digitalin and strychnine. Chloroform was administered by Dr. Primrose, and Dr. McClùre delivered her with forceps. The child was alive. The uterus relaxed and a gush of blood was allowed to escape. The uterus was then firmly grasped, and the placenta expelled. As the patient was very anæmic, it was not considered advisable to allow any more bleeding, so she was given a hypodermic of ergotin and a hot intra-uterine douche. Four hours after delivery the pulse was very feeble, and began to run. One pint of normal saline solution was run into the tissues beneath the right breast. The pulse became stronger after this. Digitalin and strychnine injections were given every six hours, and 3 drachms of whisky every two hours. Twelve hours after delivery she had rallied sufficiently to be moved into the ward.

She did very well until the fifth day of the puerperium, when her temperature rose to 104·4° F., and her pulse to 140. She was given an intra-uterine douche, and digitalin and strychnine hypodermically. The temperature fell to 99·2° F. next day. After that it remained irregularly febrile, and her pulse at times was very feeble and quick. The anæmia seemed to be progressing, so as soon as her stomach would stand it she was given peptonated iron, in addition to her cardiac tonic and stimulant. We also gave her a large saline injection into the abdominal wall. By the eighteenth day of the puerperium she was improving. The temperature was still slightly raised. In spite of all we could say or do, the husband insisted on taking her home. I saw her about ten days after she left the hospital. She was still very anæmic, but had improved somewhat, in spite of the fact that she was lying in a sunk apartment, where artificial light was necessary in the middle of the day.

The febrile condition was undoubtedly due to sapræmia in part, but I think the anæmia also contributed towards it. She had very bad ulcerating piles, and I have no doubt that infection spread from them to the vagina. The condition bordered very closely on, if it was not actually one of, pernicious anæmia.

Case VII.—*Mitral Stenosis and Incompetence along with Aortic Stenosis; Labour at Full Time.*—Mrs. B., aged thirty-two, 8-para. This patient had never had rheumatic fever, but for some years she had been troubled with breathlessness and palpitation, especially during her pregnancies. Her seventh pregnancy had ended in an abortion at the end of the third month. I first saw her when the abortion was partially completed. She was very ill, but recovered. About the sixth month in the eighth pregnancy she came for treatment, as breathlessness, palpitation, and cough were becoming very troublesome.

The apex beat of the heart was displaced quite an inch outside of the nipple line, and a distinct thrill could be felt. There was distinct pulsation in the supra-sternal notch. At the apex a rough presystolic, followed by a systolic, murmur was heard. The systolic portion of it could be heard round towards the back. Over the aortic cartilage a systolic murmur could be heard, extending up into the neck. Bronchial râles were apparent all over both lungs. Compensation had evidently failed.

The patient was at once put upon large doses of strophanthus, carbonate of ammonia, and senega. The heart quickly responded to this, and the lung condition cleared up. She went to full time, and the labour ended naturally.

These cases are sufficient to illustrate the condition during pregnancy, but I shall give notes of a few more when dealing with the disease as a complication of labour. As regards terminating the pregnancy in bad cases, I believe the best time to do that is before mid-term—*i.e.*, before the time when the strain will begin to tell on the damaged heart. When one is called to deal with a case in the later months, and the heart does not respond to the cardiac tonics, then one would be justified in inducing labour, if the condition of the patient were serious. The risk, however, is considerable, as the strain may be too great for the enfeebled organ.

Heart Disease and Marriage.—If a woman has heart disease, should she marry? How are we to answer such a question? *Punch's* famous advice is perhaps the best, but it is a little too sweeping. If, however, the woman has suffered from failure of compensation at any time, no matter what the lesion is, or if the lesion is a mitral stenosis, aortic incompetence, or incompetence and stenosis combined, the answer should be decidedly negative. The advice will probably not be followed, but, all the same, it should be given.

CHAPTER VI

COMPLICATIONS OF PREGNANCY—*Continued*

Diseases of the Respiratory Organs—Bronchitis—Pneumonia—Emphysema—Asthma—Phthisis Pulmonalis—Pleurisy—Hæmoptysis—Embolism.

DISEASES OF THE RESPIRATORY ORGANS.

BRONCHITIS and bronchial catarrh are common in pregnancy, and, as a rule, do not influence the condition, unless the coughing is so severe as to cause an abortion in the early months, or accidental hæmorrhage in the later. Some patients are troubled with excessive coughing, and no evidence of bronchial irritation can be found. The origin is a nervous one, and nervine sedatives will be required to check it.

Pneumonia.—This may occur at any time during pregnancy. Its symptoms are much aggravated by the pregnancy, and in many cases the fœtus will be prematurely expelled. The mortality is much higher than among the non-pregnant. When associated with influenza it is almost sure to prove fatal.

Treatment should be on the same lines as in ordinary cases. I have more than once seen labour occur near the crisis, and the patient make a good recovery.

CASE.—*Mitral Incompetence; Pleuro-Pneumonia and Sciatica; Premature Labour.*—Mrs. B., aged twenty-nine, 4-para, seven months pregnant. Two of the former children had been still-born, and the last one had only lived a fortnight. At the second confinement the placenta had been very adherent. There was evidence of syphilis, and the woman was a heavy drinker.

I found her suffering from severe pain in the right side, shortness of breath, and cough. She also complained of intense pain along the left sciatic nerve. Her temperature was 103·4° F., and the pulse 130. The lower lobe of the right lung was becoming consolidated, and there was also evidence of friction. The left lung was free. There was a very loud systolic murmur at the apex of the heart. It was well conducted to the back of the chest. The apex beat was displaced outwards. The patient had been very ill for two days. The child was alive. Mustard poultices were applied to the side, and she was put on carbonate of ammonia, iodide of potash, digitalis, and senega. Next day the sciatica was so bad I had to give her Dover's powder (12 grains) every four hours. On the sixth day of the illness I saw her about 10 a.m. There was then no evidence of labour; but in about two hours it commenced, and the fœtus was expelled by the breech in about half an hour. The nurse who attended her, found the body born when she reached the house. There was no sign of life in the child, and no indications of asphyxia. The placenta came away in about half an hour, but neither it nor the membranes were satisfactory, so I passed my hand into the uterus and cleared out some bits of placenta and membrane. The placenta had apparently been separated by a clot, which had burst it. There had been a fair amount of bleeding, but no active post-partum hæmorrhage. The pulse was feebler, but did not show evidence of collapse. She was given a large dose of digitalis, and whisky freely. The temperature was 103° F. Two days later the crisis occurred, and the lung quickly cleared up. The sciatica did not trouble her much after delivery.

This patient has passed through another pregnancy, and given birth to a fine, healthy, mature child. Throughout the pregnancy she took biniodide of mercury, and occasionally a little strophanthus. Good compensation was maintained, and the cardiac condition gave no trouble either during the pregnancy or labour. The labour was quite easy.

Emphysema.—The condition is aggravated by pregnancy. An abortion may occur. A subcutaneous emphysema occasionally occurs during labour. The severe straining ruptures a superficial air vesicle at the apex of the lung, and the air forces its way through the tissues and causes a puffy swelling in the neck and upper part of the chest. It will crackle under pressure. It quickly subsides after labour is over.

Treatment.—Give the usual remedies.

Asthma.—Pregnancy is liable to aggravate asthmatic attacks. Occasionally patients are met with who suffer from asthma only when pregnant, and the disease disappears when the gestation is over.

Treatment.—The usual remedies should be tried, and if they fail the patient should have a complete change of air and scene.

Phthisis Pulmonalis.—The influence of pregnancy upon phthisis pulmonalis is extremely bad. Among the laity it is generally supposed that pregnancy will benefit a phthisical patient, but this is a mistake. Not only will it aggravate the disease, but it may bring on an attack in a patient who has a predisposition to tuberculous disease. The gestation may be interrupted. In one of my cases premature labour was brought on by the excessive coughing causing separation of the placenta and accidental hæmorrhage. If the patient goes to full term, she may be so exhausted as not to be able to stand the strain of labour, but in most cases labour will not be very severe, as the child will be puny and the emaciation will have lessened the resistance of the soft parts in the pelvis. Artificial delivery may be necessary if inertia uteri comes on, and it should be done early to save exhaustion, but, in the majority of cases I have seen, the labour was easy. After delivery, the disease will progress rapidly, and prove fatal in most cases within a few weeks, or at most months. The child will be puny if born alive, and it will probably die within a few weeks.

Prognosis.—If there is distinct indication of tubercular mischief in the lungs, although it may not be very advanced, the outlook is exceedingly bad. If one be asked for an opinion regarding the marriage of a woman with a strong predisposition to phthisis, a decidedly negative opinion should be given.

Treatment.—This should be on the usual lines. In view of the fact that pregnancy has a bad effect on phthisical women, the question arises as to the advisability of clearing out the uterus in the early months. If the patient is losing ground, as she is very liable to do, after conception, I am decidedly of opinion that induction of abortion is called for. In the later months of pregnancy induction of premature labour might be called for, but it would not be so likely to benefit the patient, and might only hasten matters.

The following case will illustrate what I mean. I am indebted to Dr. James Adam, of Hamilton, for the notes:

Case I.—Mrs. D. M., aged thirty-three, October, 1904. "While pregnant in 1898 she first had slight hæmoptysis. At that time she had disease of the left apex. The child of this pregnancy never throve, and died of phthisis at the age of nine months. In September, 1899, she again consulted me, with much fever, abundant moist crepitations at the left apex, and flattening of note above the right clavicle. She improved under treatment, and was sent to Bridge of Weir Sanatorium for six months. There she improved immensely, and put on two stone in weight. The left lung dried up considerably, and the right healed. In 1902 she began to lose flesh again, and in the beginning of 1903 became pregnant. She became much troubled with sickness and anorexia ; the sickness aggravated the cough, and she lost ground rapidly. The disease extended in the left lung."

Dr. Adam sent the patient to me, and asked my opinion in regard to the advisability of inducing an abortion. The patient was willing and anxious to have the operation performed. In view of the fact that the disease was spreading, and the patient was steadily losing ground, I agreed with Dr. Adam that the induction of an abortion was perfectly justifiable.

He cleared the uterus out at the fourth month, and the patient began to improve at once ; her appetite returned, and she put on flesh. She has performed her household duties actively during the last fifteen months. At present there is cavitation of the left apex. Her menstruation has been regular since a month after the abortion.

Dr. Adam says that he is quite sure that if the pregnancy had been allowed to go on the patient would have been dead before this, and judging from my experience in such cases, I quite agree with him. If she had been allowed to bear the child it might have survived, but judging from the fate of her first child, it would probably very soon have perished of tubercular disease.

CASE II.—A patient, who had had one child about a year previously, consulted me regarding a cough. I found there was distinct evidence of tubercular infection of the apices of the lungs. She had not menstruated for a few weeks, and at first I thought the amenorrhœa was due to the lung condition, as she did not exhibit any other signs or symptoms of pregnancy ; but in a short time, on examination, I found she was pregnant. The disease advanced rapidly, and emaciation became extreme. As her first labour had been an exceedingly difficult forceps one, I was afraid she might have difficulty again, but to my surprise the child was born before my arrival, although I had been called as soon as the pains commenced. It was small and puny. The patient went downhill very rapidly after delivery, and died in six weeks. The child also died about two weeks after the mother.

CASE III.—A very anæmic, tubercular primipara consulted me regarding a slight cough and breathlessness when she was about six months pregnant. I found that her lungs were quite clear in front, but that she had rather an extensive pleuritic effusion at the base of the right lung behind, extending up to the spine of the scapula. She had never felt any acute pain.

Under treatment the effusion subsided, but she remained very weak. She went to full time. The labour proved a difficult one, as the head presented occipito-posteriorly, and I had to deliver her with forceps under chloroform. There was some post-partum hæmorrhage, which in an ordinary case would not have had any bad effect, but in such an anæmic woman was very serious. I at once plugged the uterus, and gave her a large saline injection into the abdominal wall, and a hypodermic of strychnine. For a time the pulse was quite imperceptible at the wrist, but it gradually returned. The puerperium was uneventful, but the cough became troublesome, and I then detected crepitations at the left apex. There had been none there before the labour. From that time onwards the disease gradually advanced, and proved fatal about three months after delivery. The pleurisy, as I suspected, had been a tubercular one, but active disease in the lungs themselves had not manifested itself until after delivery. This was a case in which there was a strong tubercular tendency, but it is probable that if the woman had not become pregnant, she might have gone on for years without any manifestation of the disease. I might quote a series of cases, but these are sufficient to show the risk a tuberculous woman runs when she becomes pregnant.

Pleurisy.—This disease is not influenced by, nor does it as a rule effect, the pregnancy. It may be tubercular, and then, as in the case just cited, the result will be disastrous from extension of the disease to the lungs.

Hæmoptysis.—This may occur in phthisical cases, but it may also be seen when there is no actual lung lesion. It is said to be due to a "cardiac nerve-storm" in highly neurotic women. It is also seen in cases of cardiac disease when compensation has failed.

Treatment.—In nervous cases bromides and chloral should be given, and in cardiac cases strophanthus or digitalis, carbonate of ammonia, and senega.

Embolism of the Lung.—This may occur during pregnancy, but it is much more common during the puerperium. It may cause sudden death (see cases, pp. 449 and 450).

The following case was, I think, one of embolism: The patient was within a few days of her second confinement. She was apparently quite well, and had dinner with her husband. Shortly after dinner she complained of feeling faint, and went to bed. In a few minutes she took a kind of fit, and had difficulty of breathing. She rallied sufficiently to speak to her husband, and then died. She had been dead for some time before I reached the house. The uterus was intact, and there had been no internal hæmorrhage. She had had varicosity of the veins of the legs, and I think her death had been caused by the separation of a clot from one of these veins.

EFFECT OF PREGNANCY UPON THE NERVOUS SYSTEM.

Pregnancy undoubtedly throws a severe strain upon the nervous system of most women. Irritability is often exhibited, and in many cases there is a tendency to hysteria. Many patients suffer from insomnia. The temperament of the woman may be entirely changed, in most cases for the worse—*i.e.*, a quiet disposition may be changed into a very irritable one. On the other hand, the very opposite sometimes happens, and a very irritable, cantankerous disposition changes to a mild and placid one. As a rule, however, a nervous, excitable woman will be more nervous and excitable than ever during pregnancy.

The organs of special senses are sometimes affected. There may be failure of vision, but this is most frequently associated with albuminuria. Disturbance of hearing is rare, but deaf people, as a rule, are worse during pregnancy. The sense of smell may also be affected.

CHAPTER VII

COMPLICATIONS OF PREGNANCY—*Continued*

Diseases of the Nervous System: Neuralgia—Paralysis—Chorea—Epilepsy—Hysteria—Insanity.
Diseases of the Integumentary System: Urticaria—Impetigo Hypertiformis—Herpes—Pruritis—Diseases of the Finger Nails.

DISEASES OF THE NERVOUS SYSTEM.

Neuralgia.—Obstinate neuralgias are sometimes seen. Neuralgia connected with the teeth has already been referred to, but nerves in other parts of the body may be affected—*e.g.*, the intercostals. Sciatica may occur from pressure upon the nerves, and the anterior crural nerves may be affected in the same way. Severe headache may be neuralgic, but one must never lose sight of the fact that the cause may be found in the kidneys. In all cases of headache the urine should be examined. Pain in the breasts is very frequently complained of. The intimate connection between the breasts and the uterus has already been referred to.

Treatment.—Where possible, apply local sedatives in the form of liniments; but chloral, bromides and other nerve sedatives will generally be called for. For sciatica the patient must rest in bed and keep the bowels free to relieve pressure. When the anterior crural nerves are affected, a well-fitting abdominal belt will usually relieve the pressure. In cases of headache, if albumin be found in the urine treatment appropriate to that condition must be adopted.

Paralysis.—Most forms of paralysis have been observed in connection with pregnancy. They may have been present before the pregnancy, or may occur during its continuance. When paralysis occurs during pregnancy, in the majority of cases, albumin will be found in the urine. In these cases, as a rule, recovery will take place shortly after delivery. There are other cases, however, unconnected with albuminuria. These may be due to hæmorrhage or an embolism causing hemiplegia, but occasionally cases are met with where the condition is functional. Sometimes partial paralysis of one or both legs is caused by pressure upon the pelvic nerves.

Treatment.—This must be guided by the cause. If there be albumin in the urine, the sooner the uterus is emptied the better for the patient. The other forms should be treated on general principles and be allowed to go to full time. The condition will not adversely affect the pregnancy. The labour will not be hindered by the condition. In cases of paraplegia it is usually easy. After delivery rapid improvement occurs in many cases.

Case I.—*Paraplegia.*—I was asked by a mission nurse to see a woman who was threatened with a miscarriage about the fifth month of her pregnancy. I found she was a multipara, and that she had suffered from paraplegia for some time prior to conception. The cause of the paralysis I was unable to ascertain. The miscarriage was prevented, and she went to full time and gave birth to a live child and a dead fifth-month one. The death of one fœtus had evidently occurred at the time of the threatened miscarriage. Her labour was very easy. There was no improvement in the paraplegia, as it was in no way connected with the pregnancy.

Case II.—*Hemiplegia.*—Mrs. G., 10-para, aged forty, supposed to be at full time, was sent into hospital as a case of eclampsia. She had been under treatment for six days, but we, unfortunately, received no history from her medical attendant, and had to rely on statements made by her neighbour. Six days previous to admission, while in her neighbour's house, she had fallen down in a fit. She had been unconscious for some time and unable to speak for several days, but her speech had now returned to her. She had lost the power of her right leg and arm.

On examining her we found she was very apathetic, and could not speak very distinctly. She had right-sided paresis of the arm and leg, left ptosis and dilatation of left pupil and external squinting of the same eye, but not constantly. The tongue protruded slightly to the right. The heart and lungs were fairly normal. There was no cardiac bruit. She had no pain in the head. The fœtal heart was audible. There was some slight œdema of the feet and ankles. The urine showed no trace of albumin, but reduced Fehling's solution slightly.

It was quite evident that this was a case of right-sided hemiplegia which was improving. It had probably been caused by an embolism.

The patient lay in a lethargic condition, and passed all her motions in bed. Ten days after admission a slight trace of albumin was found in her urine. The os would then admit two fingers, and there was some evidence of uterine contractions. The patient was somewhat restless, and more intelligent than she had been. On the twelfth day after admission the largest Barnes's bag was introduced, and when it was expelled the os was further dilated manually, and the membranes ruptured, when the child was expelled alive almost as soon as the hand was withdrawn.

The puerperium was normal, and the patient improved considerably before she left the hospital, and I have no doubt would ultimately recover completely.

Chorea.—This is a serious complication of pregnancy. Of the 225 cases collected by Buist (*Trans. Edinb. Obst. Soc.*, 1894–95), 60 per cent. occurred in primiparæ and 17·6 per cent. died. In many cases the disease has existed in childhood, but it does not follow that chorea will necessarily arise during pregnancy if the woman has had previous attacks. Heredity, chlorosis, and rheumatism are also predisposing causes. It is almost always aggravated by the pregnancy, and in many cases the pregnancy is affected by it to the extent of causing premature expulsion of the uterine contents. In these cases the death-rate is very high (25 per cent.). The choreic movements may become so incessant as to wear the patient out. They may be so severe that the patient can only be kept in bed with difficulty. Insanity is not infrequently associated with it, or may follow an attack.

Prognosis.—In severe cases this is very grave.

Treatment.—The treatment is the same as in non-pregnant cases—viz., large doses of arsenic, nerve sedatives, nutritious diet. The patient should be kept strictly quiet in bed. In bad cases if there is no improvement the uterus should be emptied. One must not delay this too long or the result may be fatal, but, if it is done early, the chances of recovery will be good. If insanity follows she should be treated in seclusion.

Case.—Mrs. C., 2-para, aged nineteen, was admitted to the Maternity Hospital from the Royal Infirmary suffering from chorea. Her first child had been still-born, prematurely, fifteen months previously. There was a suspicion of syphilis in the husband. Chorea had first developed about two months previous to admission. She had been in the Royal Infirmary under treatment for six weeks, and had improved considerably. Pregnancy was advanced seven months.

There were jerking movements of the left arm and hand. The facial muscles were involved, principally on the left side. The movements also affected the left leg, but not so markedly, and occasionally were present in the right arm and leg. She was readily excited. There was no rheumatic history. The cardiac sounds were prolonged and accentuated, but there was no definite murmur.

The day following admission she had an attack of screaming and violent movements, and a few days later began to manifest delusions, imagining that people were shouting at her from the street and looking in at the window. She became unreasonable and childish at times. The treatment adopted was increasing doses of liq. arsen., et hydrarg. iodid. and Battley's solution when necessary for sleeplessness. The choreic condition improved, but as her mental condition showed no improvement, it was determined to bring on labour four weeks after admission.

On examining her under chloroform, the os was found to admit one finger, and as the cervix was soft it was easily dilated, until two fingers could pass. No bougies were introduced. The labour came on, and ended by natural efforts two days later. The child was alive, and weighed 4½ pounds. The patient was very much excited during the second stage of labour. She improved slightly during the puerperium, but she still had the same delusions. Twelve days after delivery she was transferred to an asylum. The choreic movements gradually improved and the mental condition cleared up, so that a month later she was discharged as cured.

Epilepsy.—Pregnancy seems to influence epilepsy favourably. As a rule the fits are less frequent, but they are liable to occur during labour, and may be mistaken for eclampsia. The fits are identical, and one must be guided by the previous history. I have seen several cases which have been sent into the hospital as eclamptics. In one of them there was a considerable amount of albumin in the urine, but we decided from the previous history that it was a case of epilepsy.

Treatment.—Give the bromides freely.

Hysteria.—A hysterical woman will be liable to attacks during pregnancy, and she will probably take advantage of her condition to gain as much sympathy as possible. The attacks will not be likely to have any bad effects upon the pregnancy.

Insanity.—Insanity may occur during pregnancy, especially in cases where there is a strong predisposition. If the patient is in a weakly condition, as from suckling her previous child or from anæmia, etc., and if there is any hereditary tendency, the strain of pregnancy may cause a complete breakdown. Prolonged mental strain, as from the shame of an illegitimate pregnancy or from desertion, may bring it on. It may also arise in cases of chorea (see p. 64). A severe mental strain or shock will be found to be the exciting cause in most cases.

Insanity may occur during the puerperium or period of lactation, but this will be discussed later. It is less frequent during pregnancy than during either of the other periods.

It may take the form of mania or melancholia. The latter is the commoner form during pregnancy. The woman may sink into a condition of profound lethargy and stupidity. Suicidal tendencies are generally strongly developed, and if the condition continue after delivery, the patient may have strong impulses to kill her child. Moral perversions are common, such as dipsomania and kleptomania.

Primiparæ are more prone to attacks than multiparæ. Attacks are liable to recur in subsequent pregnancies. It may begin with conception, but the end of the third or the beginning of the fourth month is the most usual time for it to manifest itself. It rarely disappears until after delivery.

Prognosis.—This is generally favourable. Recovery occurs within a few months of delivery. The patient should be warned that there is considerable risk of recurrence if she should again become pregnant.

Treatment.—The patient's strength must be kept up by giving her plenty of nourishing food. If she refuses to eat she must be fed by the stomach-tube. The bowels must be kept free, and if she is anæmic, iron and arsenic should be freely administered. When there is a suicidal tendency, she must be carefully watched. If she is troubled with insomnia, chloral is one of the best hypnotics to use. She should be kept as cheerful as possible, and when able, should have as much open-air exercise as possible. If the case cannot be properly looked after at home, she should be sent to an asylum.

Diseases of the Osseous System.

There is one disease of the bones which is peculiar to pregnancy—viz., mollities ossium or osteo-malacia. It is rare in this country, but endemic in some parts of Europe and in tropical countries. Its chief characteristic is great softening of the bones, which gives rise to marked deformity of the pelvis (see malacosteon pelvis).

The patient's bones become soft; she suffers great pain in them, and severe cramp in her muscles. She has a troublesome cough and suffocative attacks. The deformity of the pelvis may cause incarceration of the uterus and retention of urine.

Treatment.—Drugs seem to have very little effect on the condition, but it can be cured by removal of the ovaries. One would be justified in inducing an abortion, especially with retention of urine. At full time, if the bones are soft, the pelvis may be expanded by the hand to allow of delivery, and, if this cannot be managed, the uterus should be removed by abdominal section.

DISEASES OF THE INTEGUMENTARY SYSTEM.

Any of the ordinary skin diseases may attack a pregnant woman, but some are said to be due to the pregnancy.

Urticaria.—Some patients are very subject to this during pregnancy, and it not infrequently attacks them during the puerperium. I have several patients who are regularly attacked by it. It may be very severe, and cause great irritation.

Treatment.—The bowels should be kept free with salines, and alkaline baths used for the irritation.

Impetigo Herpetiformis.—This may begin in the groin, round the umbilicus, or on the breasts. It comes out in small pustules, which form crusts and gradually spread over the whole skin. There will be high fever and rigors, with great prostration, delirium, and vomiting. It usually disappears in the latter half of pregnancy. The pregnancy will not be interrupted by it, unless, as not infrequently happens, it proves fatal.

Herpes.—This appears as an erythematous eruption with vesicles and bullæ. It may continue throughout the whole pregnancy and disappear during the puerperium. It is probably nervous in origin, and should be treated accordingly. It will not influence the pregnancy.

Pruritus.—Its usual seat is the vulva, but it may be general. It will be dealt with in connection with vaginal discharges.

Disease of the Finger Nails.—This is a painful affection, probably of a nervous origin, and due to malnutrition of the nails. The nails become loose and easily broken. Nerve tonics do good, but the condition is likely to last throughout the pregnancy and then disappear.

Excessive deposit of pigment in the skin is occasionally seen. The patient's face may become very blotched and disfigured. The skin of the abdomen occasionally becomes so darkened as to suggest Addison's disease. It is of no consequence except from an æsthetic point of view.

CHAPTER VIII

COMPLICATIONS OF PREGNANCY—*Continued*

Complications connected with the Genital Organs—Vaginal Discharge—Abscess of Bartholin's Glands—Tumours of the Vagina—Malignant Disease of the Cervix—Fibroid Tumours of the Uterus—Ovarian and Parovarian Tumours—Tumours of the Fallopian Tube—Displacements of the Uterus—Anteflexion—Retroflexion—Pelvic Adhesions—Rupture of the Uterus—Hydramnios—Hydrorrhœa.

COMPLICATIONS CONNECTED WITH THE GENITAL ORGANS.

Vaginal Discharge.—The normal secretions of the vagina are increased during pregnancy, so that a slight leucorrhœal discharge is usual, but in a number of cases this discharge becomes excessive—*i.e.*, one finds a vaginitis. This may be due to gonorrhœa. The discharge is usually very irritating, and soon affects the external genitals, and may cause redness and excoriation of the parts in the immediate neighbourhood. It will set up *pruritus vulvæ*, and the patient will suffer excessively from the intolerable itching. I have known the suffering to be so great that the patient threatened to commit suicide if she did not get relief.

Treatment.—Astringent and antiseptic douches may be used, but the best method of treatment I have found is to douche or swab out the vagina, and then pack it with a fair amount of powdered boracic acid and a tampon of glycerine and ichthyol. A few applications of this will usually suffice to check a profuse vaginal discharge and cure the pruritus. The application of sedative ointments to the external genitals may give a certain amount of relief, but the only way to cure the pruritus is to remove its cause—viz., the vaginal discharge.

Abscess of Bartholin's Glands.—The vulvo-vaginal glands occasionally become acutely inflamed and form an abscess, especially in gonorrhœal cases. One or both glands may be affected.

Treatment.—Make a very free incision, and keep the cavity stuffed with iodoform gauze until it heals from the bottom.

Tumours of the Vagina.—They will be dealt with when speaking of delayed labours.

Malignant Disease of the Cervix.—Advanced cancer of the cervix will prevent conception, but we occasionally meet with fairly advanced cases in pregnancy. The patient complains of a nasty blood-stained vaginal discharge, and she may have attacks of severe bleeding. The condition may be supposed to be one of abortion or ante-partum hæmorrhage.

Diagnosis.—A vaginal examination will reveal a thickened and often an ulcerated cervix. The hardness of the cancer will be easily felt in the softened cervix of pregnancy.

Prognosis.—The condition is a very hopeless one for the woman as well as for the fœtus.

Treatment.—In the early months, if the disease has not spread beyond the cervix, vaginal hysterectomy should be done as soon as possible. The pregnant uterus can be removed by the vaginal route up till the fifth or sixth month. If necessary, a vaginal Cæsarian section can be done to lessen the bulk. In the later months of pregnancy, I would be inclined to let the case go to full time if possible, and then do a Cæsarian section in the interests of the child, and remove the uterus entirely. It is not advisable to induce an abortion or premature labour with the idea of removing the uterus after it is emptied.

Fibroid Tumours of the Uterus.—The presence of one or more fibroids in the uterus may, but does not always, prevent conception. In many cases the course of the pregnancy will not be interfered with, but the labour may be obstructed. These cases will be considered later. If there be a large number of small tumours, or one or more large ones, the pregnancy cannot go to full time, so one must decide what is best to be done. An abortion or miscarriage may come on spontaneously, or may be induced, but I am decidedly of opinion that the best method of treatment is removal of the uterus and tumours. The risk of the operation will not be materially increased by the pregnancy. After an abortion there is great risk of sepsis.

Ovarian and Parovarian Tumours.—If these tumours are large they may make it impossible to allow of full time being reached, but, as a rule, this is not the case. If the tumour is fairly large, it should be operated on as early as possible. If it is small, it may be left alone, but there is considerable risk of twisting of the pedicle, and it is, on the whole, better to remove even a small one. If twisting of the pedicle occur, the tumour will become painful, and probably increase in size. It should be operated on at once. As regards the effect of the operation upon the pregnancy, an abortion or premature labour may occur, but in many cases this does not happen.

Case.—Early in September, 1902, I first saw the patient, an unmarried young woman, who was sent to me by Dr. Campbell M'Clure. She had not menstruated since the beginning of July, and she confessed to a possibility of pregnancy. On examining her, I found there was a tumour in the abdomen, extending nearly as high as the umbilicus. It was quite smooth and hard, and did not show any contractions. It was scarcely as broad as the pregnant uterus of the same height would have been. There were no sounds to be heard in it. *Per vaginam* the cervix felt soft, and the uterus enlarged. The uterus could not be made out separate from the tumour.

I gave the opinion that she was pregnant, but that she had a tumour as well, which seemed to me to be a subperitoneal fibroid growing from the fundus. Dr. M'Clure agreed with me that there was a tumour in addition to an early pregnancy. An examination under chloroform would have enabled us to definitely settle the matter, but she would not consent to this. I advised her to wait a month, and on examining her then, when the fundus had risen to the brim, there was no doubt of the condition, and I advised removal of the tumour, as it was causing her considerable pain, and it was so large that there would be great pressure in the abdomen as the pregnancy neared full time, and besides, there was always the risk of a twisting of the pedicle.

She ultimately consented to have an operation performed, and came into the Maternity Hospital on November 25. She was examined under chloroform. The outlines of two distinct abdominal tumours were quite apparent to the naked eye. The lower one was central, tending to encroach more on the left iliac region. The upper one lay to the left, its upper part under the left ribs. On palpating the abdomen, the lower tumour could easily be made out to be the uterus, pregnant to over four months. The higher tumour was quite movable, and apparently attached to the fundus of the uterus. It was an elongated oval, and felt quite tense. When it was moved to the middle line the left kidney could be palpated.

The diagnosis lay between a subperitoneal fibroid with a long pedicle and a tense dermoid cyst. I was inclined to the former.

Previous to the pregnancy the patient had never had any definite symptoms pointing to the presence of a tumour. She had commenced to menstruate at the age of thirteen. Her periods had usually lasted three days, and the flow had never been excessive. Two years ago she had been "bloodless," and the periods had then been very scanty. A course of Blaud's pills had relieved this condition, and subsequently the periods had been quite regular, until the beginning of July.

On November 28, assisted by Dr. Kerr, I performed abdominal section. A fairly large incision was necessary to get the tumour out. It was found to be a cyst of the left ovary, with a long pedicle, and adherent by a large number of long adhesions round the fundus of the uterus, and then across the top of the bladder, making a complete circle. It was impossible to differentiate the true pedicle from the adhesions. They were tied in sections with strong catgut. About fifteen ligatures were required before the tumour was freed. The pregnant uterus was handled as little as possible. The head of the fœtus was distinctly felt lying towards the left side. The abdominal wound was closed in three layers.

The patient stood the operation very well, and in the evening the temperature was 99·4° F., and the pulse 104. There was no sickness.

The bowels were moved by calomel and a saline on the third day, and on the evening of the fifth day there were some uterine contractions, but a small dose of morphia stopped them. The patient seemed to do well until the seventh day, when she became very ill. The temperature was 101° F., and the pulse 136. There were no indications of peritonitis, nor of an abortion. She was listless, and in the afternoon became almost comatose, and was thought to be dying. As there were no indications of peritonitis, I concluded she was suffering from toxæmia, probably caused by absorption from the uterine contents, so I decided to pass a sound into the uterus and bring on an abortion. The liquor amnii had no bad odour. She rallied a little, and uterine contractions came on in a few hours, and the contents of the uterus were expelled about fifteen hours after the passage of the sound. The fœtus was macerated, and had a foul odour. An intra-uterine douche of lysol was given.

The abdominal wound had yielded in two places, and a portion of omentum protruded. The protruding portion of omentum was ligatured and cut away. It was not even injected, and the bowels were perfectly healthy-looking. Then through and through silkworm-gut sutures were passed, and the wound completely closed. While this was being done the patient did not complain of any pain.

Within twenty-four hours the temperature had fallen to normal, and from that time onwards she made a good recovery, except that a deep bedsore formed over the lower part of the sacrum, and was very slow in healing.

When the stitches were taken out the wound was found to be very firmly healed.

It is difficult to say when the fœtus perished, but I think it probably did so during the operation. Its death may have been caused by the chloroform. I do not know why the absorption from the macerating uterine contents had such a profound effect upon the patient. The cervix was closed, and the sac intact until the sound was passed, so it is difficult to understand how the uterine contents could have become septic. There can be no doubt, however, that the serious condition of the patient was caused by absorption from the uterine contents. The poison had a most alarming effect, and at one time (a few hours before I passed the sound) death seemed almost inevitable. The dulled condition of sensation was very marked; the patient hardly winced when I was restitching the wound. The formation of the bedsore was also, I think, due to the effect of the poison in lowering the vitality of the tissues.

The tumour, which was about the size of a large cocoanut, contained pulpy sebaceous material, but there were no hairs or teeth seen in it. The cyst wall was fairly thick and fibrous.

The patient's health has been fully restored, and she suffers no inconvenience.

Tumours of the Fallopian Tube.—These are exceedingly rare. A pyo- or hydro-salpinx is occasionally found, and in a few rare cases an extra-uterine gestation has co-existed with an ordinary uterine pregnancy.

Treatment.—The affected tube should be removed as soon as possible. A pyo-salpinx may remain quiescent during pregnancy, but it will be sure to set up septic mischief in the puerperium (see Case IV., p. 437).

Displacements of the Uterus.—During the first three months of pregnancy the uterus is still in the pelvic cavity. As it increases in weight it tends to sink somewhat. If the pelvic floor is normal, no actual prolapse will occur. The patient may experience a certain amount of discomfort from weight and bearing down, especially if she is constipated, but the disturbance will be trifling. On the other hand, if the pelvic floor has been weakened or partially torn, prolapse to a lesser or greater degree will occur. It is rarely seen in primiparous women. As a rule, the prolapse does not pass beyond the second degree, but in a few cases it becomes complete. The patient suffers from bearing down and dragging sensations in the pelvis, and micturition may be interfered with.

Treatment.—Replace the uterus, and support it by means of a ring pessary. The support should be worn until the beginning of the fifth month at least, as by that time the uterus will have risen into the abdominal cavity, and will be supported by the brim of the pelvis. When there is any tendency to prolapse, the patient should rest as much as possible.

Anteflexion.—This is the normal position of the uterus. If it is exaggerated, the patient will suffer from considerable irritability of the bladder until the fundus has risen above the brim. Treatment will not be necessary, except, perhaps, to give sedatives for the bladder irritability.

Retroflexion.—This is a much more serious condition. In the majority of these cases there has been a tendency to posterior displacement before impregnation, but it may be caused by a strain or blow. If there has been a tendency to a posterior displacement before impregnation, then, as soon as the uterus begins to increase in weight, it sinks in the pelvis, and the tendency to posterior displacement is increased. In all cases of prolapse there is more or less posterior displacement. The weight of the uterus soon causes it to fall back upon the rectum. If the patient allow her bladder to become overdistended, this also pushes the fundus back. As the body of the uterus increases in size, the cervix becomes jammed against the neck of the bladder, and emptying of the latter becomes impossible. Overdistention results, and, finally, either a continuous dribbling of urine from overflow comes on, or else the bladder ruptures. By the beginning of the fourth month the fundus uteri should be rising above the brim, but as it is caught under the promontory, this is prevented. It may free itself and rise above the brim, but if the bladder is overdistended, this is hardly likely to occur. If the ovum does not perish, but goes on growing, more and more pressure is made upon the perineum, and it, as well as the posterior uterine wall, may begin to slough. A portion of the uterus may grow above the brim, while the incarcerated portion remains jammed in the pelvis. An abortion may occur, but, from the position of the cervix, the uterus has great difficulty in emptying itself, so that the contents are liable to be retained. If the urine becomes septic, the infection may spread to the kidneys.

Signs and Symptoms.—The patient complains of pain in the back and bearing down. Difficulty in micturition comes on, after a time she is unable to empty her bladder, and finally the urine begins to dribble away. As the bladder distends, a tumour manifests its presence in the abdomen. The patient probably has considerable difficulty in walking.

Diagnosis.—Whenever a woman complains of dribbling of urine in the early months of pregnancy, one should at once suspect a posterior displacement of the uterus. If the bladder is distended, a pyriform tumour, much larger than the uterus should be at the time of pregnancy which she has reached, will be felt in the abdomen. A vaginal examination will reveal a rounded cystic swelling in the posterior part of the pelvis. The cervix is usually to be felt high up behind the symphysis pubis.

Prognosis.—If the case is early recognised and properly treated, there should be no particular risk to either mother or fœtus, but, if the condition is "left to nature," it becomes a very serious complication of pregnancy.

Treatment.—In an early case without distention of the bladder, the uterus should be replaced at once, and a suitable pessary inserted. When the bladder is distended, it should first be relieved by catheter, with the precautions already stated. In some cases the uterus may be replaced at once, but it is generally necessary to delay reposition until next day. The bowels should be thoroughly cleared out, and the bladder completely emptied before attempting the operation. To facilitate matters chloroform should be given. The fundus may be pushed up by two fingers in the vagina, but by passing them into the rectum you get better leverage on the posterior wall. If the cervix is caught with forceps, and pulled down at the same time, replacement will be facilitated. By placing the patient in the knee-elbow position you may assist matters. When the uterus is replaced, an Albert Smith, Hodge, or ring pessary should be inserted. It is well to administer an opiate to prevent uterine action being set up. The pessary can be taken out in about two months' time, when the uterus has risen well into the abdomen.

In some cases spontaneous reposition occurs after the bladder has been emptied, as in Case III., but one cannot trust to this occurring. Some authorities say that if a ring pessary is inserted the uterus will almost invariably right itself, but I maintain that replacement is necessary before the insertion of the ring.

You may fail to replace a badly incarcerated uterus. Then you must either lessen the bulk by passing a sound in and rupturing the ovum, or by puncturing through the posterior uterine wall and drawing off the liquor amnii; or else you must relieve the condition from above by opening the abdomen and drawing the uterus out of the pelvis. The latter method is preferable to the former, as the pregnancy would not necessarily be interrupted. The operation has now been done several times with success.

Of the many cases I have seen, the following three may be given :

CASE I.—A multipara, pregnant for the third time, came to me complaining of severe pain in the back, and inability to pass urine, and she also stated that something was coming down. She was three and a half months pregnant. Dribbling of urine had not commenced, as retention had only existed for a few hours. The patient, who had been dosing herself heavily with quack medicines certified to remove all female obstructions, was terribly afraid that she had done herself some serious mischief.

On examining the abdomen I found the bladder distended, and, *per vaginam*, the elongated anterior lip of the cervix protruding from the vulva, while the retroflexed body of the uterus lay low down in the posterior fornix. The uterus was not only retroflexed, but it was considerably prolapsed. The urine was drawn off, and the patient was instructed to have her bowels well cleared out and to take no food the following morning. Under chloroform, after the bladder was emptied, reposition was easy, by drawing down the cervix and tilting up the fundus through the rectum. A large-sized Albert Smith pessary was inserted, and a morphia suppository administered to quieten uterine action. A few days later the pessary was expelled while straining at stool, but the retroflexion did not recur. A large ring was inserted, and left in for two months, and there was no further trouble.

CASE II.—A multipara, aged twenty-four years, was brought into the hospital with a temperature of 102° F., and very feeble running pulse. She stated that for six weeks she had had a nasty watery discharge from the vagina. She thought she was six months pregnant.

On examining her, the abdomen was found to be distended by a tumour extending as high as the umbilicus. It was tender. A very foul discharge was coming from the vagina, and on passing the fingers in, a portion of the uterus was found incarcerated in the pelvis. On passing a catheter, several pints of frightfully stinking urine were drawn off. From the odour, the organism in the urine was judged to be the *Bacillus coli*. The incarcerated portion of the uterus was raised without much difficulty. The membranes were evidently ruptured and the fœtus macerated. The patient had become so collapsed that we had to give her a large saline injection, and freely stimulate her with strychnine. I had intended to wash the bladder out and leave some boracic solution in it, but she became so collapsed I did not attempt this. Next morning, I was agreeably surprised to find she had rallied, and that her temperature was normal. The bladder was washed out, and a considerable amount of blood was found in it. She was put upon urotropin, with daily irrigation of the bladder. The septic condition of the urine quickly improved.

The fœtus, which had evidently been dead for some time, was expelled six days after admission, and as the placenta was adherent, chloroform was administered to remove it. The patient again collapsed, and for some hours she was practically pulseless, but with saline and strychnine injections she again rallied. The urine was now clear, and the bladder irrigation was discontinued. She was able to pass urine herself. On the tenth day after the miscarriage she voided several ounces of almost pure pus, although the urine had been quite clear for days. It looked as if an abscess in the bladder wall had burst, but on investigating matters I found that the uterus had again become retroflexed, as soon as it had involuted sufficiently to come below the promontory. On passing a catheter, clear urine was got at first, and then the residual urine loaded with pus. The bladder was again washed out. The patient, unfortunately, refused to allow the uterus to be replaced, and left the hospital.

For six weeks before admission she had had dribbling of urine, but for how long the urine had been septic we could not judge. I fully expected that the kidneys would have been affected, but they seemed to have escaped. The mucous membrane of the bladder must have been badly affected, as considerable quantities of it came away in shreds each time of washing out.

Case III.—The patient, a multipara, was sent into hospital from the country. Two physicians had seen her, and had come to the conclusion that it was a case of extra-uterine gestation, which had suddenly increased in size, presumably from hæmorrhage. The pregnancy had advanced to a little beyond the third month.

On admission the patient's pulse was found to be normal, with absolutely no indications of shock or hæmorrhage. The abdomen was occupied by a pyriform cystic swelling which reached above the umbilicus. When my resident reported this to me, I had no hesitation in telling him before I had seen the patient that the probability was we had to deal with an overdistended bladder. On examining the patient, I found the diagnosis was correct. There was no dribbling of urine, but the patient stated that for several days she had only been able to pass very small quantities of urine.

The bladder was partly emptied by catheter, but no attempt was made to replace the uterus. Next morning, when I examined the patient with the intention of replacing the uterus, I found it had righted itself. This is the only case in which I have known this to occur.

Pelvic Adhesions.—If a patient has had an attack of pelvic inflammation prior to impregnation, and adhesions have been left behind, she will be almost sure to suffer more or less pain during the pregnancy. The pain is caused by the stretching and tearing up of the adhesions, which must occur as the uterus rapidly grows. If the adhesions are many and the uterus badly bound down, the suffering will be great, and an abortion is likely to occur. I have seen this in more than one instance. In cases of ventro- or vagino-fixation of the uterus the adhesions must necessarily stretch, and the patient may suffer considerably.

Diagnosis.—Early in pregnancy one may be able to make out the adhesions *per vaginam*, but later on an examination will reveal nothing but tenderness on pressure. The diagnosis will then have to be made from the history of a previous attack of inflammation.

Treatment.—For the pain it may be necessary to give sedatives.

Case I.—A woman who had had several children came under my care, suffering from great pain in the pelvis, especially at her periods. She had had several inflammatory attacks, and the parts were very much matted together. Douching and tampons relieved her somewhat, but she suffered so much that I strongly advised an operation. She was averse to this, and unfortunately became pregnant. As the uterus enlarged the pain increased. Before she reached the end of the third month she aborted. The deciduæ were very adherent, and I had to clear the uterus out, but the patient made a good recovery.

Case II.—A multipara, about seven months pregnant, complained of severe pain at the left side of the uterus. This pain had been present from early in the pregnancy. The urine was normal, and there were no indications of the presence of a renal calculus. The uterus was tender to the touch along the left side. As the patient had had an attack of cellulitis at her previous confinement, I concluded that the pain arose from the stretching of old adhesions. She was given morphia when necessary, and went to full time.

Rupture of the Uterus.—In the great majority of cases of rupture of the uterus the accident occurs during labour, but it occasionally happens during the later months of pregnancy. It may be caused by a severe crushing accident, but it is wonderful how much violence may be applied to the uterus without causing it to give way. The skull or other bones of the fœtus may be fractured and yet the uterus escape rupture. Spontaneous rupture may occur in cases of degeneration of the muscular fibres of the uterine wall, or at the seat of a former rupture, or at the scar of a Cæsarian section. The elastic fibres seem to be the ones chiefly affected. The rupture frequently occurs at the placental site, so fatal hæmorrhage is frequent. The fœtus may not entirely pass into the abdominal cavity, and in that case it will act as a plug and control the bleeding.

Diagnosis.—In traumatic cases the history points to what has occurred, but in the spontaneous cases this is wanting. The patient is collapsed, and shows evidence of internal hæmorrhage, pointing to the rupture of a viscus. If the fœtus has passed entirely into the abdominal cavity, it is easily palpated, and is found free from the uterus. If it is only partly out of the uterus it is felt protruding through the uterine wall.

Prognosis.—It is an exceedingly grave condition.

Treatment.—Abdominal section and removal of the uterus would be necessary, but one of the other methods of treatment, which will be given in connection with rupture during labour, might be adopted. In a case of spontaneous rupture, if the uterus is not removed, the patient should certainly be sterilized to prevent a recurrence in a future pregnancy.

Hydramnios.—Hydramnios, or an excessive amount of liquor amnii, is occasionally met with as a complication of pregnancy. In many cases the pregnancy will not be interrupted, but, as we shall see later, the overdistention of the uterus will cause delay in labour. In a few cases, however, the inconvenience to the patient is so great that the pregnancy will have to be terminated, if premature labour does not come on spontaneously. The amount of distention of the uterus may be very great. In some cases this takes place very rapidly within a few days—*acute hydramnios*—but in most cases the increase is much slower.

In nearly one-half of the cases there is some abnormality in the fœtus—*e.g.*, anencephalus, spina bifida, etc. The condition is much more common in multiple than in single pregnancies. One amniotic sac only is affected. It is much more common in uni-ovular than in binovular twins.

The amount of fluid varies much, but it may be very large, amounting to over 6 gallons. The largest amount I have been able to measure was 2½ gallons in Case I. In composition the fluid does not differ from ordinary liquor amnii, but it is said to contain a little more urea.

The exact cause of the condition is not known. By some it is said to be due to great activity of the fœtal kidneys. In anencephalic monsters irritation of the exposed brain is supposed to stimulate the kidneys to great activity. In uni-ovular twins one sac only is usually affected, and it has been found that the heart of the fœtus in that sac is generally hypertrophied. Wilson has supposed that for some reason or other this fœtus has received a larger supply of blood than the other, and this has caused hypertrophy of the heart and kidneys, and an excessive excretion of urine. In Case II. the twins were uni-ovular, but to all appearances they were equally developed. The condition occurred so early in the pregnancy that it seems to me the fœtal kidneys could not possibly have excreted such a large amount of urine in so short a time. I have also seen a case with a fairly large amount of liquor amnii where the kidneys were cystic, and the urethra was imperforate, so that no urine could have been voided into the amniotic sac.

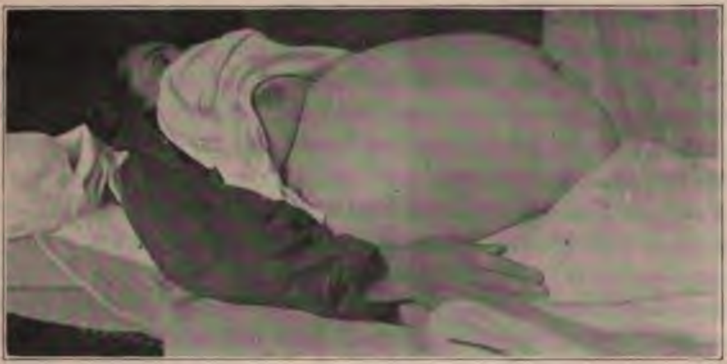


FIG. 2.—A CASE OF HYDRAMNIOS AT THE EIGHTH MONTH.

Symptoms.—These are due to pressure on the various organs and nerves. There may be a good deal of pain, as in Case I., but the most urgent symptom is usually difficulty of breathing. There may be severe dyspnœa and cyanosis, and the patient may not be able to lie down. Œdema of the lower extremities and vulva may be marked.

Diagnosis.—In a moderate case the fœtal parts can usually be palpated, and the fœtus found very freely movable. The fœtal heart is heard with difficulty, and in many cases cannot be detected. In an extreme case you may not be able to palpate the fœtus at all.

It is sometimes difficult to diagnose a multiple pregnancy from hydramnios, and the two are often combined. In an ordinary multiple pregnancy you can feel the fœtal parts easily, and you should be able to make out more than one fœtal pole.

In cases of acute hydramnios with great distention, the condition has not infrequently been mistaken for a large ovarian cyst. The presence of the signs and symptoms of pregnancy and careful auscultation should keep one right.

Treatment.—It is only in cases of great distention that treatment will be required during pregnancy. The membranes should be punctured, and the uterus left to empty itself. There is considerable risk of atonic post-partum hæmorrhage if the uterus is emptied quickly, so it is better to wait and allow the uterine muscle fibres to regain tone. In most cases the fœtus will be deformed, so no risk need be run in its interests.

Case I.—Mrs. H., 6-para, aged twenty-nine years, was first seen by me at her home for Dr. Christie. Her abdomen was very much distended, quite as much as at full time, although she still had two and a half months to go. She complained of considerable pain in the right side. Two weeks later I took her into hospital. The distention had increased a great deal, and her sufferings also. Her breathing was very much embarrassed, and she could not lie down. She had had twins twice.

By abdominal palpation no fœtal parts could be detected. A uterine bruit could be heard, but no fœtal heart. The case was clearly one of hydramnios, but whether or not of multiple pregnancy it was impossible to say. I decided to puncture the membranes on the following morning. During the night uterine contractions came on, and next morning I found the os was about half dilated and the membranes still intact. I ruptured the membranes, and collected 2½ gallons of liquor amnii. When it was all drained away a face presented. I had intended not to deliver at once, but to wait for the uterus to gain tone, so as to lessen the risk of post-partum hæmorrhage, and I would have left the delivery to nature if I could have flexed the head, but this was impossible. The patient was put under chloroform, and I then found the fœtus was anencephalic, which explained why the head could not be flexed. Delivery was easily effected by means of a crotchet hooked into the base of the skull. There was a large ventral hernia, extending up inside the cord for about 4 inches. The uterus remained flabby for some time after delivery of the placenta, but there was no post-partum hæmorrhage. An intra-uterine douche of suprarenal gland (30 grs. to the pint) was given, and also a hypodermic of 3 grains of ergotin.

The patient made an uninterrupted recovery.

Case II.—Mrs. McG., a multipara, was admitted to the hospital from Irvine. I had seen her the day previous in consultation with Dr. Wilson. The patient stated that she was about four months pregnant, and that the pregnancy had followed the usual course until about three weeks before, when she had a slight bleeding. She was positive that until then the abdominal distention was not greater than it should have been. After the bleeding the abdominal distention had rapidly increased, until, at the time I saw her, it was much greater than at full time. The fundus of the uterus was as high as it could rise, and it was markedly cordate, and much broader than usual. The uterus was tender and tense, but no fœtal parts could be detected. There was a distinct uterine bruit, but no fœtal heart could be heard. No movements had been felt by the patient. Dr. Wilson, junr., was quite sure that he had made out a distinct crepitant sensation to the side of the umbilicus, and I also felt what I thought were crepitations,but after admission to the hospital I could not make them out. However, in hospital, while auscultating the patient's heart, I made out loud, coarse crepitations a little below the cardiac area. The sounds seemed to originate either in the upper part of the uterus, or else between the top of the uterus and the diaphragm. There had never been any vaginal discharge, except the small amount of blood three weeks previously. The patient's pulse was very good, so there could not have been any internal hæmorrhage. On admission, the patient's greatest girth midway between the sternum and the umbilicus was 38 inches.

There was no doubt that we had to deal with a case of a large amount of liquor amnii in the uterus, but the case did not seem to me to be one of hydramnios pure and simple. I came to the conclusion that it was a case of vesicular mole in a case of twin pregnancy, with hydramnios in the other sac. When I detected the loud creaking crepitations at the upper part of the left side of the fundus I at once thought of the possibility of the cysts having perforated het fundus.

I decided to empty the uterus, but before doing this the abdomen was prepared for section, as I made up my mind that if the uterine hæmorrhage was excessive, or if it was a case in which the cysts had penetrated the uterine wall, I would remove the uterus at once. About three hours before the time for operation uterine contractions set in and the membranes ruptured. The amount of liquor amnii was very great, but it could not be measured. A gallon was collected, but there must have been more than in Case I. There was a good deal of bleeding before I reached the hospital. The os would admit two fingers. I at once inserted Frommer's dilator and dilated the cervix to about a half and extracted two fœtuses, and removed a large single placenta. Both horns of the uterus contained a large amount of very thick decidua, which was removed by the fingers. The post-partum hæmorrhage was not excessive. A suprarenal douche was given, and a hypodermic of ergotin and strychnine.

The patient made a good recovery, but on the sixth day her temperature suddenly rose to 104·2° F. An intra-uterine douche was given, and the temperature fell to normal within twelve hours, and never rose again.

The placenta was soft and gelatinous, and Dr. Edwards, who examined it microscopically, reported: "The placenta showed slight degeneration of the syncytium and excessive proliferation of the connective cells of the villi. The villi were irregular in size and shape, some swollen and œdematous. In the decidua there was nothing definite of an abnormal nature."

In this case my diagnosis was wrong. The absence of discharge was certainly against the presence of cystic disease of the chorion, but all the other indications were in favour of this disease. The loud creaking crepitations just under the cardiac area were very interesting. I think they were caused by the rubbing of the fundus against the diaphragm. Dr. Brewis, of Edinburgh, has told me of a case of a fibroid of the uterus in which there was a sudden increase in size, and where the same feature was observed, and was at first supposed to be due to pericarditis. After the operation, which was successful, no friction could be detected.

Hydrorrhœa Gravidarum.—Occasionally during pregnancy the patient suffers from a discharge of watery fluid from the vagina. This may dribble away or come in a gush.

There are two theories as to the source of this fluid—the one that it is really liquor amnii which escapes from time to time through a valvular opening in the membranes, and the other that it is a secretion from the glands in the decidua: glandular hyperplasia of the decidua is said to be present.

The following case is of very great interest in more ways than one:

CASE.—The patient was a primipara, on whom an operation for appendicitis had been performed a year or two previously. She had always suffered a good deal at her periods, and had had endometritis before her marriage. The pregnancy, her first, dated from February 16. Her health was good until July 18, when, while sitting in a tramcar, a heavy man was thrown by a jolt of the car into her lap. His whole weight came upon the right side of her abdomen just over the scar of the appendix operation.

The patient suffered considerable shock and a great deal of continuous pain, attended by some uterine contractions. There was no discharge of any kind from the vagina. The pain lasted two or three days, and left the patient very nervous and much out of sorts. She went to England for a holiday, but was in bed all the time—a period of three weeks—owing to recurrence of the pain and uterine contractions, which generally occurred every second night. At each time after several contractions the abdomen became distended and the uterus very tense, and there was an escape of a clear fluid from the vagina. This was followed by relief. Only once during this time was the fluid coloured red. The os uteri was quite closed.

The patient returned home about the middle of August, and was well only for a few days, when pain and contractions again recurred, but not so frequently as before; nor was there much, if any, watery discharge. At this time she suffered from cystitis. The bladder was washed out and the cystitis relieved, but the frequency of micturition continued to the end of the pregnancy. About the middle of September there was a slight discharge of blood from the vagina during defæcation. There was pain and discomfort in the back before the blood came away. The patient again kept her bed, and the bleeding subsided. At the end of September she was wakened one night by pain and severe contractions of the uterus, which ceased on the expulsion of a large clot and some fluid blood.

I saw the patient in the morning, and examined her carefully under chloroform. There was very little liquor amnii in the uterus, and the fœtus lay with its head presenting. The os was quite closed, and there was no discharge coming. There was a suspicious boggy feel in the fornices. There was a good deal of tenderness at the right side of the uterus in the region of the abdominal scar. I was unable to decide whether the case was one of accidental or unavoidable hæmorrhage. The history of the passage of a clot with immediate relief to the pain pointed rather to the former. The patient was kept in bed. There was no more bleeding until November 23, when another clot, but not so large as the previous one, was passed with pain. On November 25 another large clot was passed, with very severe pain. The pain now continued until the child was delivered on the 27th. I saw her on the 25th, and found she was suffering very severely from irregular uterine contractions, but the os was not dilating. She was given full doses of morphia, and this relieved her.

On the morning of the 27th regular labour pains came on, and there was some bleeding, but not very much. I examined, and found the os would admit a finger, and that I had to deal with a case of complete placenta prævia. She began to bleed very profusely, so I quickly plugged the vagina very firmly with iodoform gauze. This was left in for five hours, and when it was removed the os was dilated sufficiently to admit a Champetier de Ribes's bag. By putting traction on the bag dilatation was nearly complete in about an hour, when I passed my hand through the placenta, and turned the child. I delivered slowly in order not to injure the cervix, fully expecting the child would be dead, but to my surprise it was alive, and began to breathe without artificial respiration being necessary. The placenta and complete sac of membranes came away quickly, and there was no post-partum hæmorrhage. The patient was not collapsed, and her recovery was uninterrupted. Her temperature never rose above normal. The child, a female, was a fair size. The mother was able to nurse it.

The sac of membranes seemed to be quite complete, but of course there might have been a small valvular opening in it. Apart from the hydrorrhœa, there are some very interesting points in connection with the case. In the first place, the severe injury, which must have nearly burst her uterus, did not cause a miscarriage. At the first glance one would say that low implantation of the placenta would have made the patient more liable to miscarry than if the placenta had been high up, but I am inclined to think that, if the placenta had been high up, it would, in all probability, have been crushed by direct violence, and a miscarriage have been brought about. The passage of clots is unusual in a case of placenta prævia. The explanation of this may be due to the fact that the os was very firmly closed, and the blood was retained until it set up such strong contractions that it was finally expelled in the form of a clot, and in the meantime the sinuses had been sealed. Another unusual feature is that the pregnancy went to full time. I think the small amount of liquor amnii contributed to this, because, from the time I saw the patient—*i.e.*, during the last two months of the pregnancy — the head of the fœtus was always down hard against the placenta, and the pressure would check the bleeding.

When we come to consider the hydrorrhœa, how are we to explain the escape of the fluid if it was liquor amnii, or even if it came from the glands of the decidua ? The placenta completely covered the os, and how could it get out without separation of the placenta, unless it found its way through the centre of the placenta ? And in that case it must have been liquor amnii. The fact that there was very little liquor amnii in the uterus towards the end of pregnancy would point to it having been that fluid. And, again, the fact that it never, except on one occasion, was stained with blood, would, I think, militate against its having come from the decidual glands. On the whole, I am inclined to think it really was liquor amnii which escaped through the part of the placenta immediately over the os.

CHAPTER IX

COMPLICATIONS OF PREGNANCY—*Continued*

Venereal Diseases—Gonorrhœa—Soft Chancres—Syphilis—Effect of the Disease upon the Placenta—Effect upon the Fœtus—The Effect of Injuries or Surgical Operations.

VENEREAL DISEASES.

Gonorrhœa.—There can be no doubt that gonorrhœa is present in a good many cases treated in hospital, especially among the unmarried. It is impossible to say how frequent it may be, as it is an exceedingly difficult disease to diagnose in a pregnant woman unless the gonococcus is looked for. In bad cases the vaginitis and cystitis will show its presence, but there are many cases in which the woman seems to suffer very little from it, and these may be easily passed over. The occurrence of ophthalmia neonatorum in the child may be the first indication one gets, and in hospital cases we are largely deprived of this means of diagnosis, as the eyes of every child are treated preventatively as soon as it is born. Yet, in spite of this, cases do arise every now and again.

The woman may have had gonorrhœa prior to conception, or she may have contracted it during the pregnancy. If she has had it some time prior to conception, the gonococci may have invaded one of the tubes and set up a pyosalpinx. This may prove very disastrous during the puerperium by setting up septic peritonitis. The case recorded on p. 437 was probably of that nature. There can be no doubt that a good many cases of sepsis have their origin in gonorrhœa. The gonococci offer a very great power of resistance to the vaginal bacteria.

Gonorrhœal warts are occasionally seen, and they may be so large and numerous as to obstruct labour. They will be so foul and septic that they may prove a very serious source of infection during labour or the puerperium (see case on p. 225).

The glands of Bartholin, one or both, may become affected and suppurate, causing the woman great pain. They should be dealt with either by total extirpation or free incision and drainage.

When gonorrhœa is recognised during pregnancy it should be carefully treated, even although it is not causing the woman any inconvenience. The risk will come during the puerperium. The child's eyes must be carefully seen to as soon as the head is born.

Treatment.—Astringent and antiseptic douches may be used, but packing the vagina with powdered boracic acid is preferable. Douching during pregnancy is somewhat risky, as uterine action may be set up. When warts are present, they should be carefully excised and the wounds stitched.

Soft Chancres.—Among a certain class these are occasionally seen. They will be very foul and septic, and if present at the time of labour will prove a very serious source of infection.

Treatment.—Cauterize them freely with fuming nitric acid and dress with iodoform. If they are present at the time of labour nitric acid can hardly be used, but they should be very thoroughly swabbed all over with pure carbolic, after the vagina has been as well disinfected as possible.

Syphilis.—If a woman has had syphilis a short time prior to conception, the fœtus is sure to be affected. If, on the other hand, the disease is acquired during gestation, the fœtus may escape, especially if the infection has occurred late in pregnancy, but in many cases it is affected. If the father of the child is suffering from the disease in a latent form, the fœtus will be affected and the mother may show no indications of the disease. The woman's system will be rendered immune to the disease—at least, in so far that in nursing her own syphilitic child it will not infect her, while, if the same child were allowed to suck a non-syphilitic wet nurse, the nurse would contract the disease from it. The mother may, however, be infected through the utero-placental circulation and have the usual manifestations of the disease.

After a certain length of time the disease will lose its power of transmission by either parent; but how long that time may be has not been definitely settled. It probably varies in different individuals. Fournier gives four years as the maximum, but cases have been recorded in which ten or twelve years have elapsed and yet a syphilitic infant was begot.

Primary syphilis, when acquired at the time of conception, may assume a virulent type, and cause considerable ulceration of the labia and vagina. If the chancre or mucous patches should be present at the time of labour, they would be a very dangerous source of infection.

The chief risk, however, is not from this, but from the effect the disease has upon the deciduæ and uterine contents. The result is, that in a large number of cases the pregnancy ends in an abortion, miscarriage, premature labour, or labour at full time with a macerated fœtus. A patient who has no antisyphilitic treatment may have several abortions or premature labours, a little later each time, until finally the disease, as it were, works itself out, and a live child is born at full time.

Effect of the Disease upon the Placenta.—Both the maternal and fœtal portions of the placenta are affected. To the naked eye, syphilitic placentæ may differ considerably, according to whether the child is dead or alive. If the child has been dead for some time the placenta may be almost white and soft to the feel. If the child is alive and at full time the placenta will be thick and of a pinkish colour from the greatly thickened maternal part. There are often hæmorrhages into its substances, more or less organized. Calcareous degeneration is also common, and sometimes large fibrous masses are found.

Microscopic section of the villi will show that they are increased in size and distorted in shape from infiltration with granulation cells. The epithelial covering will also be degenerated. The vessels in the villi may be completely blocked. In the maternal portion there will be an enormous overgrowth and degeneration of the decidual cells, which will encroach upon the intervillous spaces.

According to Frankel, the seat and extent of the lesion varies with the manner and time of infection. If it is a sperm infection—*i.e.*, from the father—the villi will be affected with granulation cell infiltration and degeneration of their epithelial covering. If the mother is infected at the same time, the deciduæ as well as the villi will be affected. If the woman is syphilitic before impregnation, the deciduæ will be chiefly affected. In infection in the later months of pregnancy the placenta may remain unaffected.

Effect upon the Fœtus.—The disease may so affect the deciduæ and placenta as to cause the very early death of the ovum. In the fœtus itself the disease manifests itself in many ways. There may be bullous eruptions on the skin. I have seen a case in which these were present on the hands and feet, and full of pus at the time of birth. Condylomata and inflammation of the mucous and serous membranes are often present. There may be gummatous deposits in various organs and tissues of the bodies, and a characteristic osteitis, and osteo-chondritis. The dividing line between the epiphysis and shaft will be broad and jagged, and yellow in colour. This is due to premature ossification which has ended in necrosis and suppuration. The liver may be enormously enlarged, so as to fill the greater part of the abdominal cavity. Ascites is common, and many adhesions may be found in the abdomen.

In many cases at birth the child may show no external indications of the disease, but in a few days—at longest within three weeks—they begin to appear in the form of snuffles, a coppery coloured rash (first about the buttocks, but soon becoming general), mucous patches in the mouth and about the anus, etc. Sometimes a bullous eruption of pemphigus appears instead of the coppery erythema. The child will soon begin to pine away, and if not promptly treated, will soon die. In many cases the child will be puny and ill-developed.

Prognosis.—Pregnancy is influenced most unfavourably by syphilis. If untreated the disease proves fatal to the majority of the fœtuses. Fortunately the disease is most amenable to treatment, and, if the patient will only undergo regular treatment during the whole pregnancy, she will probably go to full time and give birth to a live child.

Treatment.—Mercury alone or combined with iodide of potash should be given continuously throughout the whole pregnancy. In the earlier months the patient should be extra careful not to exert herself at the times corresponding to her menstrual periods, as she is very liable to abort at these times. Both parents should, if possible, be put under treatment, but one has to be very cautious in attempting this, or trouble may be caused.

CASE.—Mrs. C., aged twenty-two, 3-para, had given birth to two stillborn macerated syphilitic children before she was twenty-one. She showed no indications of the disease herself, and said she had never had a rash, but there was no doubt about the condition of the fœtuses. I did not care to interrogate the husband, as I knew it would cause trouble. As Mrs. C. was extremely anxious to have a live child, she consented to undergo treatment in the event of again becoming pregnant. She took a mixture of liq. hydrarg. perchlor. and pot. iodidi continuously throughout the third pregnancy and went to full time. At birth the child seemed perfectly healthy, but it may yet develop slight manifestations of the disease. I have seen this in some cases (see also case Mrs. B., p. 57).

THE EFFECT OF INJURIES OR SURGICAL OPERATIONS.

Injuries to any part of the body other than the uterus may cause a termination of the pregnancy through shock, but this does not invariably happen. Even a very serious blow upon the uterus, sufficient to cause fracture of the skull or long bones of the fœtus, may not bring on uterine action. Neurotic women are more liable to be affected by shock than others.

Surgical operations are not contra-indicated, but those on any part connected with the pelvic organs should be postponed, if possible, until some time after delivery, or until the child is viable, so that if a premature labour comes on the child may be saved. Operations on the uterus, tubes or ovaries are an exception to this, as they should be done as early as possible in pregnancy, to allow of the abdominal cicatrix becoming firm before labour comes on. If sepsis is avoided, the risk to the pregnancy is not very great, even in operations upon the uterus itself. Fibroid tumours have been enucleated from the uterus without interrupting gestation.

Naturally one would avoid operating during pregnancy, if delay would not in any way endanger the patient. If, on the other hand, the patient would suffer from delay, the operation should be undertaken without hesitation. To lessen shock an anæsthetic should be used, even in comparatively small operations like the extracting of teeth.

CHAPTER X

COMPLICATIONS OF PREGNANCY—*Continued*

Specific Fevers as a Complication of Pregnancy—Small-pox: Cases—Typhus: Cases—Enteric: Cases—Plague: Case—Scarlet Fever: Cases—Diphtheria—Measles: Cases—Influenza: Case.

SPECIFIC FEVERS AS A COMPLICATION OF PREGNANCY.

I AM indebted to Dr. Brownlee, Superintendent of Belvidere Fever Hospital, for notes of the following cases of small-pox, typhus, and enteric fever occurring in pregnant women. As I have had little or no experience in dealing with such cases, my remarks must be general, and based upon the experience of others.

Small-pox.—Small-pox, especially in its virulent form, is said to have the most disastrous results upon pregnancy of any of the fevers. Mild attacks may not affect the pregnancy at all, but, if the attack has been severe, an abortion or miscarriage is very likely to occur. The miscarriage may occur during convalescence. The fœtus may contract the disease *in utero,* and may be born with the eruption upon it, or the eruption may appear within a few days of its birth. If the woman passes safely through the attack, and goes to full time, the child, although it shows no indication of having had the disease *in utero,* will probably be immune to vaccination. In 1901 I did a Cæsarian section on a patient seven weeks after her discharge from the small-pox hospital. She had had a very mild attack. The child showed no indications of having had the disease, but three attempts at vaccination proved unsuccessful. In a second case, also, recently confined in the hospital a few weeks after an attack of small-pox, vaccination of the child was unsuccessful. The mother in this case had had a very severe attack.

Prognosis.—In severe attacks, the pregnancy is very likely to be interrupted, and the danger to the woman is very great. In milder attacks, there is a considerable risk of the pregnancy being interrupted, and this increases the danger, but expulsion of the uterine contents does not invariably happen.

Treatment.—The usual treatment must be adopted, and if the uterine contents are expelled, the utmost care must be taken to prevent septic infection, and to insure that the uterus is thoroughly emptied.

CASE I.—*Abortion between the Third and Fourth Months during Convalescence from Small-pox.*—Mrs. B., aged thirty-three, a multipara, was seized with sickness, headache, and rigor on April 7. The eruption began on the 9th with two papules on the fingers and one or two on the arms. Her son had been admitted to the Fever Hospital eleven days before, and she had been revaccinated two days later. The vaccination had taken satisfactorily. She said she had been vaccinated in infancy, but the mark was very indistinct. When she was admitted, on April 10, the eruption was beginning to show on the back. She was about four months pregnant.

The eruption became fairly abundant, and ran its full course.

April 30.—The patient was up, feeling fairly well, but complained of some pain in her back. Next day the pain in the back was worse, and the uterus expelled its contents. The abortion seemed complete.

May 3.—The temperature rose to 100° F. An intra-uterine douche was given, and the temperature rose to 104° F., but on the morning of the 6th it had fallen to 99° F., rising again in the evening to 101·8° F.

May 7.—An intra-uterine douche was given, as the temperature was still up. The discharge was not fœtid.

May 10.—The uterus was curetted and douched, but there was very little to remove.

May 12.—The temperature was 102·2° F., but the patient maintained that she felt quite well. There was decided dulness to percussion, and resistance, but no tenderness in the left iliac fossa.

May 20.—The temperature has continued to rise to 100° or 101° F. The cervix was found low down, with little or no mobility of the uterus, and there was well-marked resistance in the posterior and left fornix. Ichthyol tampons were used daily.

May 24.—An abscess had suddenly formed in the left groin. It was incised and drained.

June 10.—The incision had healed. *Per vaginam*, the resistance in the left fornix had almost entirely disappeared. There was some resistance in the pouch of Douglas, but no tenderness. The uterus was quite movable and involuted.

The patient was dismissed well on June 21.

The risk to this patient was undoubtedly very much increased by the abortion and subsequent cellulitis. Instead of being in hospital about a month, as she would have been if she had not aborted, she had to remain nearly two and a half months.

CASE II.—*Miscarriage at the Sixth Month.*—Mrs. McL., aged thirty-nine, multipara. The patient considered herself pregnant about six months. Her last three pregnancies had resulted in two early miscarriages, and the third in a dead-born child, about two years ago

She had been seized with shivering, sickness, and vomiting on February 11, and the eruption had appeared on the 14th. She was admitted on the 15th. The rash was pretty abundant and discrete on the 18th, papulo-vesicular and pustular, with considerable erythema between the spots. It was fairly evenly distributed over the face, scalp, back, arms, and legs, also on the palms and soles. There were some papules on her tongue. Her vaccination mark was very doubtful.

March 7.—Pains began suddenly, and on examination the os was found to be about the size of a florin and the membranes tense. The fœtus was expelled at 6.30 a.m. on the 8th. The placenta was removed from the vagina, and there was little bleeding. Her puerperium was quite normal, and she was dismissed well on March 29.

The miscarriage had no bad effect in this case. She seemed prone to miscarry, so there was little chance of her pregnancy continuing.

Typhus.—In the present day typhus is, generally speaking, a rare disease, but in Glasgow small localized epidemics are still not very uncommon. In the early days of the Maternity Hospital a good many cases were dealt with, especially in the outdoor department. The pregnancy is very liable to be interrupted, and the risk to the woman is very great. The high temperature alone may have a deleterious effect upon the fœtus, but I should think it is the typhus poison which actually causes its death.

CASE I.—*Abortion of a Fleshy Mole.*—Mrs. M., aged twenty-seven, 5-para; amenorrhœa for four months. Admitted December 6.

The patient had been ill about a week with general malaise, headache, pains all over, and feverishness. The bowels were constipated, and she had been sick and vomiting. Her temperature was 103° F., pulse 112, and respiration 36.

December 7.—She had not slept, and was much troubled with a cough. The bowels had moved, slight, constipated motion; temperature 103·6° F., pulse 114, and respiration 32. Her face was somewhat dull and flushed generally, eyes slightly injected, pupils small. She was quite sensible, and complained only of headache and cough. Her tongue was dry and slightly coated.

Rash.—On the arms there was slight general erythema, and a few spots appeared. On the trunk only a few spots, macula, fading on pressure, reddish in colour; on the feet only a few spots.

The heart-sounds were good in quality, and the pulse good. Some râles were audible at the base of the lungs.

The urine was dark, straw-coloured, acid, and contained a distinct trace of albumin.

December 8.—Had passed a better night after getting bromide. At noon her bowels moved freely, and she began to pass blood and clots from the vagina in considerable quantity. *Per vaginam* the os was felt slightly dilated, but nothing but clot could be felt.

December 9.—As there was again some bleeding, the vagina was plugged. The patient felt much better. There was very little evidence of a rash, and the tongue was moist. The temperature last night was 103° F., and this morning 101·2° F. She looked much brighter. In the evening the plugs were removed, and the uterus was cleared of a mass about the size of a hen's egg. This was evidently a fleshy mole. There was no bleeding. After that she did very well, although the vaginal discharge was fœtid. The temperature varied between 99·6° and 102·8° F. for a few days.

She was dismissed well on January 22.

Case II.—*Incomplete Abortion.*—K. H., single, aged twenty-three; length of amenorrhœa not stated.

This patient was admitted on January 28 in the second day of her illness. Her temperature was 102·6° F., pulse 104, and respirations 28

January 29.—The patient was very bright, and stated that her headache and pains had improved. Her tongue was moist, and there was no rash. Her heart-sounds were normal and her lungs clear. There was a slight trace of albumin in her urine. Her spleen was enlarged 4½ by 3½ inches.

January 31.—Her headache was bad again. Her face was suffused.

February 2.—She complained of abdominal pain and pain in the back. A placental mass, and a portion of membrane, were expelled from the uterus.

February 4.—The face and conjunctivæ had become suffused. The patient was dull and stupid, with muttering delirium. The tongue was dry and brown in the centre. The rash had appeared. Her pulse was very feeble, and there was now some bronchitis present. The vaginal discharge was fœtid, but douching soon put it right.

February 19.—She was now convalescing favourably. The muttering delirium had lasted about a week. The bronchitis had cleared up, and the cardiac weakness yielded to treatment. There was no further development of the rash. She was dismissed well.

From the description, it would seem that this patient was suffering from an incomplete abortion at the time of admission.

Enteric Fever.—This is the fever of which we see most cases in the maternity hospital. We usually have several cases each year. The patients come to us in labour, with a history of having been out of sorts for a week or two. The temperature is found to be raised and the pulse quickened, but beyond that there may be nothing definite. The bowels are usually constipated. After the labour is over the temperature remains high, and diarrhœa probably begins. The rash over the abdomen is hardly ever seen, as the striæ mask it. It is extremely difficult to distinguish the condition from one of sepsis. Diarrhœa and enlargement of the spleen are common to both. The Widal test is most useful. If a good reaction is got, one may be pretty confident the case is one of enteric. In all cases of fever during the puerperium, where there is the least suspicion of enteric, the Widal test should be applied. Sepsis is very liable to arise. In two of my cases the Widal reaction was obtained from the infant's blood.

Expulsion of the uterine contents occurs in about three-quarters of the cases, and it is only in very mild attacks that the pregnancy is not interrupted. I do not consider the prognosis as regards the woman any worse than in non-pregnant cases.

Case I.—*Abortion.*—J. McM., aged thirty. Length of amenorrhœa not stated.

This patient was admitted on February 3. She had been ill for ten days with sickness, headache, backache, diarrhœa, and abdominal pain. She had been confined to bed for eight days. Her temperature was 104° F., pulse 112, and respirations 28. Her skin was pale generally, and there was an abundant crop of very typical rose spots. Her pupils were dilated, the tongue dry, hard and brown, with transverse cracks. The abdomen appeared normal, but she complained of pain low down in the right iliac region, and there was tenderness on pressure. The spleen was markedly enlarged; its lower edge at the costal margin.

The heart-sounds were pure, but feeble. The lungs were clear.

There was a vaginal discharge, which had been going on for a day or two, and was supposed to be menstrual.

The disease ran a fairly typical course. The vaginal discharge continued, and on the 14th, the twenty-second day of the illness, a rounded mass about the size of a large walnut was expelled from the vagina. The abortion was quite complete. A couple of days later the temperature fell to normal. There had been retention of urine for some days previous to the abortion, and the urine had become ammoniacal. The bladder required to be washed out. She was dismissed quite well on March 31.

From the description of the mass expelled, the abortion must have been an early one.

CASE II.—*Abortion.*—Mrs. B., multipara. Amenorrhœa of about three months.

This patient was admitted to hospital on April 18, three weeks after the onset of her illness. She had been confined to bed for a week. Deafness had manifested itself four days before admission. Her bowels were constipated. She stated that she had been suckling a child for three years, and that her last menstrual period had been in January, but a flow of blood had commenced just before admission. She had had enteric fever when six years old.

Her temperature was 101·6° F., pulse 128, and respiration 46.

The patient looked very ill. The tongue was clean but dry, and brownish in colour. The pulse was quick, soft, and somewhat irregular. The abdomen was distended and tympanitic, but there was no gurgling or tenderness. The spleen was not palpable. No rose spots were seen. The heart's action was weak, but there were no murmurs. In the lungs râles were distinctly heard. Vaginal examination gave evidence that an abortion had occurred.

Next morning some large clots were expelled from the vagina. The uterus was cleared of clot by the fingers, and an intra-uterine douche given.

The disease ran an ordinary course, and there were no pelvic complications. The temperature fell to normal on May 7, but four days later it rose again and kept up for a week. The patient had evidently had a relapse.

She was dismissed well on July 9. In this case the abortion had evidently occurred before the patient had reached the hospital, as nothing but clot was found in the uterus.

Plague.—Among the cases of plague which occurred in Glasgow in 1900, one of the women patients was eight and a half months pregnant. The following is the report of the case taken in full from the report issued by the medical officer of health :

'*Premature Labour.*—Mrs. M., twenty, admitted September 15.

The duration of the illness was a little doubtful, owing to the difficulty of obtaining an accurate history of the patient from her friends. It was, however, certainly under forty-eight hours. The onset had apparently been very severe; headache, pain in the back, diarrhœa, and great prostration being the most marked symptoms. The patient was very much emaciated, and had undergone great privations for some time prior to admission. The face was pallid, the lips dry and covered with sordes, and the tongue likewise dry, with a brown fur. The temperature was 102°·6 F., the pulse, which was soft and rapid, numbered 140, and the respirations 40. The patient was eight and a half months pregnant, and on admission labour was already in progress. The only physical signs observed in the lungs were some subcrepitant râles at both bases. There was a large, indurated, and very tender bubo in the left inguinal region. No rash was observed. On the evening of admission 20 c.c. of serum were injected intravenously, and 20 c.c. into the area immediately below the left groin, so that it might drain directly into the bubo. At the time of the injection the temperature had fallen to 99·6° F., and the patient was much collapsed. At 4 a.m. the os was found to be fully dilated, and as by this time the patient's general condition was one of extreme gravity, instrumental delivery was at once effected. The child was born asphyxiated, and after much trouble was resuscitated. No gross lesion of the placenta could be observed. After the birth of the child the patient rallied a little. The temperature rose to 103·8° F., the tongue and lips became cleaner and moister, and the patient expressed herself as feeling a little better. On September 16, 20 additional centimetres of serum were injected subcutaneously into the abdominal wall. During the day the patient's state became more and more grave, and she died at 11.50 p.m. A pure culture of the plague bacillus was obtained from the bubo on admission, and also from the blood. On examining the bubo after death, no plague bacillary forms which did not bear evidence of the most profound degeneration could be discovered, though in the spleen and other organs of the body typical uncultured forms were easily seen."

Post-mortem examination, September 18, 1900, by Dr. R. M. Buchanan.

"*External Appearance.*—The body is very well developed and well nourished. The abdomen is much distended, and presents the greenish discoloration of commencing putrefaction. With this exception, the general surface of the body is pale. There is a slight fulness observed over the area of Scarpa's triangle on the right side.

"*Chest.*—The heart is of firm consistence. Over a small area at the apex of the left ventricle there is a group of small hæmorrhages, under the pericardium, extending into the muscle superficially. The muscle is slightly paler than normal, and a slight degree of cloudy swelling is evident. The valvular structures are normal.

"The lungs are hyperæmic posteriorly and œdematous.

"*Abdomen.*—The liver, spleen, and kidneys are hyperæmic.

"The uterus in its form, size, and position is characteristic of recent delivery. It is firmly contracted, and the internal surface is lined by a filmy coating of blood-clot.

"*Glands.*—The right inguinal glands are considerably enlarged. The vertically disposed glands, together with a retroperitoneal (lower iliac) gland form a chain, in which each gland is very similar in size and appearance. On section they are found to be fully ½ inch in diameter, while the cut surfaces are of firm consistence, intensely hyperæmic, and darkly mottled. The surrounding tissues are œdematous, but free from hæmorrhage. The retroperitoneal gland is the largest of the group in virtue of its elongated shape. The prevertebral glands, in the same way, are also notably affected. The glands generally, including those of the mesentery, are slightly enlarged and hyperæmic.

"*History of the Baby.*—Baby M., born in hospital September 16, at 4.30 a.m. Though the mother had a blood infection of *B. pestis* (V.S.), the placenta showed no macroscopic lesion. At birth the child was completely asphyxiated, and no spontaneous attempt at respiration was made for almost three-quarters of an hour.

"For eight days the child seemed to be quite well, but on the ninth day it was observed that the neck seemed rigid, and on examination some induration was discovered on the left side of the neck high up, at the posterior border of the sterno-mastoid. Next day a few isolated glands could be felt, about the size of a pea, in the above-mentioned situation, and the group of glands lying in the anterior triangle of the neck were by this time also affected. On the right side there were also some enlarged lymphatic glands, but not so large as those on the left side. The temperature, which had previously not risen above 99·6° F., rose on this morning to 101° F. Next day the child refused its food, and vomited frequently. The child rapidly sank, and died on the following afternoon."

Scarlet Fever.—If the attack be a severe one, scarlet, like other fevers, is very likely to cause a premature termination to the pregnancy. An ordinary mild attack will probably neither influence the pregnancy, nor will the disease be influenced by the woman's condition. It has been asserted that pregnant women are not very susceptible to scarlet-fever infection, but this is doubtful. The disease is usually contracted in childhood, and, as one attack is generally protective, most childbearing women are to a very large extent immune to it. It is a much rarer disease in pregnancy than enteric.

Prognosis.—This will certainly be somewhat graver than in non-puerperal cases, but the risk is not very much greater.

I am indebted to Dr. James Todd for notes of the two following cases:

Case I.—*Premature Labour.*—M. B., unmarried, aged nineteen, 1-para, seven months pregnant. The fœtus had been dead for some time. Three days after the confinement the patient was seized with sickness, vomiting, and sore throat. Next morning the rash was seen.

On admission to the Fever Hospital, on the fourth day of the puerperium, a dull red, distinctly punctate, rash was seen over the chest and arms, but fainter and more papular on the legs. There was a diffuse blush over the abdomen. The throat was congested and the glands not enlarged. The tongue had a distinct thick yellowish fur on its dorsum, with papillæ showing through at the tip.

The heart was normal.

The abdomen was flaccid, with no tenderness anywhere. The uterus was ill defined. The cervix was high, and the os patulous and soft. The discharge had a strong odour.

Shortly after admission the patient began to vomit, and her pulse became soft and rapid. She complained of headache, and was dull mentally, rambling at times. Her urine and fæces were passed in bed.

On the fifth day of the puerperium she was quite unconscious, vomiting everything. Her temperature was 102·2° F., and the pulse very rapid and soft.

Under chloroform the uterus was explored. The cavity was about half the size of a uterus immediately after delivery. Soft tissue was found in the upper part, and about a tablespoonful easily removed. It appeared to be a placental tissue. The uterus was flushed out with 1 in 60 carbolic lotion. The patient stood the chloroform well.

On the sixth day of the puerperium she became rapidly worse. In the afternoon she had a rigor which lasted about five minutes. She died at 2.55 a.m. on the seventh day of the puerperium.

Unfortunately, no post-mortem examination was obtained. There was undoubtedly an element of septicæmia present, but the fever was probably of a malignant type, as the patient's little sister, fifteen months old, sickened with a sore throat, and died two days later without a rash appearing.

CASE II.—*Abortion.*—Mrs. R., multipara, aged twenty-six. Amenorrhœa had lasted two months.

This patient had aborted at the end of the second month, two days before she had been seized with sickness, vomiting, headache, and sore throat. The rash had been seen on the fifth day.

She was admitted to the fever hospital on the eighth day of her illness. The rash was then fading, and desquamation commencing on the neck. Her temperature was 101·4° F.

The disease ran an ordinary course, and she was dismissed well in about seven weeks.

In this case the patient had done a heavy washing the day before she aborted, so that the scarlet fever had probably nothing to do with causing it. It was two days after the abortion before she sickened with the fever.

Diphtheria.—I have never seen a case of diphtheria in a pregnant woman, and it seems to be very rare, but it is occasionally found during the puerperium. The typical exudate containing the Klebs-Löffler bacillus will be found on the vaginal mucous membrane as well as upon the pharynx.

When I was in charge of the West End branch of the Maternity Hospital I saw a case. A day or two after delivery the patient's temperature rose, and I discovered a diphtheritic exudation on the vaginal mucous membrane. The throat also showed typical patches. The source of infection was easily traced, as there had been a case of diphtheria in the house a short time before. The patient was removed, so I could not follow up the case.

Septicæmia is very likely to arise in such cases. The Klebs-Löffler bacillus has occasionally been found in the discharges in cases of septicæmia where diphtheria was not suspected. The relationship between the two diseases seems very close.

When the bacillus is found the anti-diphtheritic serum should be used at once.

Measles.—If the attack is a mild one the disease will probably run an ordinary course, and the pregnancy be unaffected. On the other hand, in severe attacks there is considerable risk of expulsion of the uterine contents. Nearly half of the severe cases are said to end in this way. Occasionally the child is born with the rash upon it. In cases of delivery during an attack there is said to be a tendency to post-partum hæmorrhage.

As a complication of the puerperium, measles was held by no less an authority than Sir James Simpson to be a very serious disease, but experience in our hospital does not bear this out. All the cases we have had have run an ordinary course.

Case I. — *Full-time Labour.*—A. G., single, aged twenty-eight, 2-para, had been working in the hospital for several months prior to her confinement. On April 3 she had felt out of sorts, but had showed no marked coryza. In the evening, labour was found to have commenced, and the rash was noticed. Her temperature was 99° F. The labour was normal, lasting nine and a half hours. There was no tendency to post-partum hæmorrhage. The child, a female, weighed 7½ pounds. Next day the rash was well out. The patient was kept in hospital for three days, and then removed to the measles ward of the fever hospital. The highest point the temperature reached, 101° F., was on the evening of the first day of the puerperium. The subsequent course of the disease was quite regular.

The child, which had remained with her during the three days that she was in the Maternity Hospital after delivery, was taken to one of the receiving houses and kept under observation for two weeks. It remained quite well. It is possible that it may have been rendered immune to the disease, just as the infants in the two small-pox cases already referred to were immune to vaccination. My experience has been that, when a new-born infant is exposed to the infection of measles immediately after birth, the disease develops very rapidly, and the rash appears in about a week. Possibly the infection takes place through the stump of the cord. In this case, however, no rash appeared, although at that time we had no separate cots for the infants, and the child was therefore in bed with the mother for three days.

Case II.—*Full-time Labour.*—In this case the patient was exposed to the infection of measles on the day when labour commenced.

A. McK., single, aged thirty, 1-para, was admitted December 11, and delivered December 12. The child, which weighed 9½ pounds, was delivered by forceps, as the second stage of labour was prolonged. The perineum was slightly ruptured, and required two stitches. The puerperium was perfectly normal until the seventh day, when the temperature rose from 99° F. in the morning to 101° F. in the evening. Until the thirteenth day, the temperature was never below 100° F., and on the evening of the eleventh day it reached its highest point, 103·4° F. On the morning of the thirteenth day it fell to 99° F., and she was found to be covered with a copious measles rash, which had come out during the night. During all these days she had never complained of any special pain or discomfort, except from the heat. The lochia were sweet, and involution of the uterus had gone on steadily. She had never shown any signs of coryza. I was at a loss to account for the temperature, but felt sure that it was not due to septic absorption. The incubation stage had lasted exactly fourteen days. It was only after the rash had developed that we found out that a child had sickened with measles in the house the patient was staying in the very morning before she came into hospital.

She was removed to the measles ward of the Fever Hospital, where the disease ran an ordinary course. Her infant had been taken away by her friends, and I was unable to find out whether or not it developed the disease.

In both of these cases it is remarkable that the coryzal indications were absent.

Influenza.—Unfortunately, the term "influenza" is often very loosely applied to all forms of feverish colds. An influenza cold is not a serious complication of pregnancy, but the true influenza is. The risk to the patient, especially if a pulmonary complication arises, is very great. The uterine contents may, not improbably, be expelled, and the patient die within a few days, or death may occur without an interruption of the pregnancy.

Case I.—Mrs. D., 5-para, aged thirty-seven, eight months pregnant, began to suffer from severe headache, pains throughout her body, and feverishness. For two days she treated herself, but on the third day I was called to see her, as her breathing had become embarrassed. I found her very ill, with a temperature of 103° F., and a pulse of 120. Her abdomen was very much distended. The uterus was as large as a full-time one, from excessive liquor amnii. Her legs were swollen. At the base of the right lung there was evidence of commencing consolidation.

The patient was very restless, and could not get sleep. Her urine was free from albumin.

In spite of most active treatment the patient got no relief. The temperature remained very high, and at the time when the crisis should have occurred there was no fall. Instead of a crisis, the pneumonia spread to the left lung, and the patient died on the twelfth day after the onset of the pneumonia. I was unable to determine whether or not the fœtus had died previous to the mother, as it was impossible to make a proper examination. The uterus remained quiescent, and showed no indication of expelling its contents.

In reference to these cases of specific fevers in pregnancy and the puerperium, an important question arises in regard to puerperal fever. Will the infection of any of the fevers give rise to puerperal fever? I do not think it will of itself, but a patient suffering from any of the fevers is a most favourable subject for the germs of puerperal fever to work upon. There can be no doubt that septicæmia is very prone to arise in such cases. The high temperature and the low vitality of the patient's tissues are most powerful predisposing factors in favour of septic invasion.

Erysipelas, I believe, will give rise to puerperal fever, because the micro-organisms are identical; but in the other cases where the micro-organisms are quite distinct, the one cannot change into the other, but may assist the other, by preparing the way for its entrance.

In treating cases of fever after the uterus has emptied itself, or has been emptied artificially, the most absolute aseptic precautions should be taken, both at the time and subsequently, to guard against sepsis.

If a practitioner is attending fever cases, should he attend confinements? If he is seeing many fever cases, especially erysipelas, I think he should refrain from midwifery work. A general practitioner, who is seeing an occasional fever case, cannot very well help himself, but before going to a confinement after seeing a case of fever, he should be careful to change his clothes and thoroughly disinfect his hands and arms.

CHAPTER XI

LABOUR AND ITS MECHANISM

Powers—Passages—Passenger—Diameters of the Pelvis—Planes of the Pelvis—Inclination of the Pelvis—Attitude of the Fœtus—Presentation—Position—The Fœtal Head—Sutures—Fontanelles—Diameters of the Fœtal Head—Stages of Labour—Premonitory Symptoms—False and True Pains—The First Stage of Labour—The Second Stage—The Third Stage—Effect of Labour on the Child—Caput Succedaneum—Duration of Labour—Normal, Laborious, Preternatural, Complex, Missed Labour—The Mechanism of Labour.

BY the term *labour* is meant the expulsion of the uterine contents. It is a *mature or full-time labour* when the fœtus has reached its full development, and a *premature labour* if before full time, but not before the fœtus is viable—*i.e.*, from the seventh month.

The three principal factors concerned in labour are the *powers*, the *passages*, and the *passenger*.

The *primary powers* are the contractions of the uterus, while the *secondary powers* are the contractions of the abdominal muscles. The primary powers are involuntary, while the secondary are voluntary, but towards the end of labour they too become practically involuntary. The primary powers are concerned first, with dilating the lower uterine segment and the cervix, and second, with expelling the uterine contents. The secondary powers take no part in the dilatation, but materially assist in the expulsion. The weight of the uterine contents assists by gravity, especially during the early part of labour, if the woman stands or walks about.

The *passages* are the lower uterine segment, the cervix, the vagina, and the bony pelvis round all.

The *passenger* is the fœtus with placenta and membranes.

DIAMETERS OF THE PELVIS.

External Diameters.—The most important are the intercristal—the distance between the widest part of the iliac crests;

the interspinous—the distance between the anterior superior spines; and the antero-posterior or external conjugate—the distance between the tip of the last lumbar vertebra and the front of the symphysis pubis (Baudelocque's diameter). These measurements are made by means of calipers. The intercristal one should be about 11 inches, and the interspinous about 10 inches. They vary according to the size of the pelvis, but in a properly shaped pelvis there should be about 1 inch difference between them. Baudelocque's diameter should be about 7½ inches, but it is of very little importance.

Internal Diameters.—These are taken at the brim, in the cavity and at the outlet. They are four in number—viz., the antero-posterior or conjugate, two obliques (right and left), and the transverse.

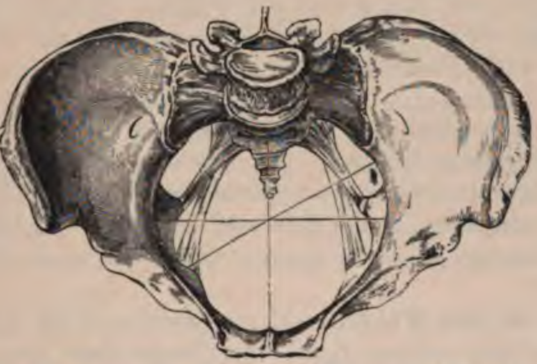


FIG. 3.—BRIM OF PELVIS, SHOWING THE CONJUGATE, OBLIQUE, AND TRANSVERSE DIAMETERS (PLAYFAIR).

At the brim, the antero-posterior or conjugate is measured from the centre of the top of the sacral promontory to the centre of the top of the symphysis pubis. The right oblique is measured from the right sacro-iliac joint to the left ilio-pectineal eminence. The left is measured from the left sacro-iliac joint to the right ilio-pectineal eminence. The right is slightly longer than the left, but the difference is very slight.

The transverse is measured from the middle of the brim of one side to the same point on the other side. Sandstein has recently pointed out the fact that the transverse diameter is, on an average, one-half the length of the intercristal.

In the cavity, the same measurements can be taken about its centre. In a normal pelvis they are all about equal.

At the outlet the conjugate is measured from the tip of the coccyx to the under edge of the symphysis pubis. As the coccyx is usually more or less movable, this diameter can be increased by pressing the coccyx backwards.

There is no fixed point from which to measure the obliques.

The transverse is measured from the back part of one ischial tuberosity to the same point on the other.

The following table gives the measurements, in a form in which they can be easily remembered. These diameters are slightly less than the ones usually given. They may be taken as representing the smallest normal pelvis. Anything less than these show that the pelvis is a contracted one.

	Conjugate.	Oblique.	Transverse.
Brim - - - - -	4 in.	4½ in.	5 in.
Cavity - - - - -	4½ ,,	4½ ,,	4½ ,,
Outlet - - - - -	5 ,,	4½ ,,	4 ,,

You will notice that the smallest diameter at the brim, the conjugate, becomes the largest at the outlet, while the largest at the brim, the transverse, becomes the smallest at the outlet. The obliques can only be measured at the brim and in the cavity, but it is convenient to consider them the same at the outlet as at the brim and in the cavity.

Planes of the Pelvis.—If you were to place a saw on the ilio-pectineal line, and cut right back through both iliac bones, following the line all the way back to the top of the promontory, the saw would pass along the plane of the brim. Or, if you were to cut a piece of paper the exact shape of the brim, and place it in the brim, it would lie exactly in the plane. If hundreds of these sheets of paper were placed in the cavity, they would represent the different planes, and, in the same way, one in the outlet would represent the plane of the outlet. The plane of the outlet is not parallel to that of the brim, because the pelvic canal is not straight, but curved, the posterior wall being very much longer than the anterior.

Inclination of the Pelvis.—The brim makes with the horizon an angle of about 54°. In the erect posture the anterior superior iliac spines and the top of the symphysis are in one perpendicular plane—*i.e.*, the superior spines lie directly above the upper margin of the symphysis, the acetabular notches look directly downwards, and the tip of the coccyx is slightly above the apex of the pubic arch. Seeing the dried disarticulate pelvis, one is very apt to forget this, and to think of it as being placed at right angles to the spine.

The Axis of the Pelvis.—An axis to a plane is a line drawn at right angles to the centre of the plane. If we were to find the axis of each of the large number of planes of the pelvis, from brim to outlet, and then connect all these points, we would get a curved line, running through the pelvic cavity, midway between its walls. This is the axis of the pelvis, and it indicates the direction to be travelled by the presenting part of the child during labour. In the living person the direction of the axis of the brim is represented by a line drawn from the umbilicus to the tip of the coccyx. Taking the plane of the outlet as extending from the lower border of the symphysis to the tip of the coccyx, the axis of the outlet will run from the promontory directly downwards. In the living subject, however, the vulvar opening lies considerably farther forward than this, and its axis runs very much farther forward. The axis of the outlet is practically at right angles to that of the brim. In delivering with forceps, etc., it is of very great importance to remember the direction of the different axes, so as to apply traction in the right direction—viz., downwards and well back at the brim, and then coming gradually forwards, until finally you are pulling at right angles to the line of your first traction. This curved axis is known as the curve of Carus.

Attitude of the Fœtus.—By this is meant the relation of the different parts of the fœtus to each other. The fœtus is developed in an attitude of flexion. The head and arms are flexed on the chest, the thighs on the body, the legs on the thighs, and the feet on the front of the legs, while the trunk itself bends forwards. This arrangement allows of the packing of the fœtus into as small a space as possible. For a short time after birth this tendency to flexion, especially of the thighs, feet, and legs, will persist.

The **presentation** of the fœtus is usually defined as the part which lies over the os uteri, and is that part which is felt by the examining finger—*e.g.*, vertex, or head presentation, transverse, or shoulder presentation, breech presentation, face presentation, etc. A better way to treat of presentations would be to divide them into two main divisions—viz., longitudinal and transverse—and define the presentation as the relation of the long axis of the fœtus to the long axis of the mother. In longitudinal presentations the axes would correspond, while in transverse they would be more or less at right angles. The longitudinal ones would be again divided into two main subdivisions, according to which pole of the fœtus came first, head or breech, and the transverse, into dorso-anterior and dorso-posterior.

The **position** of the fœtus means the relation which the presenting part bears to the pelvis. There are four principal positions, right and left anterior, and right and left posterior, according as the presenting part lies to the right or left side of the pelvis, to the front, or to the back.

The attitude of the fœtus is practically always the same, more or less flexed, but the presentation and position frequently change during pregnancy. In the vast majority of cases it is the head which presents, most frequently with occiput coming first, turned towards the left side and front of the pelvis—*i.e.*, in the left anterior position.

The Fœtal Head.—The fœtal skull differs from the adult one in the bones not being firmly united together. The membranous union allows of considerable moulding of the head as it passes through the pelvis. The occipital bone can slip under the posterior end of the parietals, and the frontals under the anterior ends, thus lessening the antero-posterior diameter of the head, while one parietal can slip over the other and lessen the transverse diameter.

There are four *sutures*—viz., the *frontal*, between the two frontal bones; the *sagittal*, between the two parietals and continuous back from the *frontal*; the *coronal*, between the parietals and frontals; the *lambdoidal*, between the parietals and the occipital bone. Where the coronal suture crosses the junction of the frontal and sagittal sutures, there is a lozenge-shaped membranous space, the *anterior fontanelle* or *bregma*, and at the posterior end of the sagittal suture, where it meets the angle of the lambdoidal, there is a much smaller triangular space, the *posterior fontanelle*. It is important to be able to recognise the fontanelles by touch, so as to make out the position of the head. The anterior is the larger, is lozenge-shaped, and has four sutures running out from it—viz., the frontal, sagittal, and the halves of the coronal. The posterior one is the smaller, is triangular in shape, can be enlarged by depressing the tip of the occipital bone, and has three sutures running out from it—viz., the sagittal and the two halves of the lambdoidal.

The portion of the top of the head lying between the two fontanelles is known as the vertex.

DIAMETERS OF THE FŒTAL HEAD.

The longest antero-posterior diameter, the *occipito-mental*, is measured from the tip of the occipital bone to the tip of the chin (5 inches); the next in length, the *occipito-frontal*, is from the occiput to the root of the nose (4½ inches); while the shortest, the *sub-occipito-bregmatic*, extends from the nape of the neck to the anterior fontanelle (4 to 3½ inches). The sub-occipito-bregmatic measures 4 inches when the head is not flexed, as the front end of the diameter is then taken from the front of the anterior fontanelle, but when the head is much flexed it measures 3½ inches, as the front end then lies at the back part of the fontanelle. The greater the amount of flexion of the head the shorter this diameter is. The importance of this will be seen when we deal with labour.

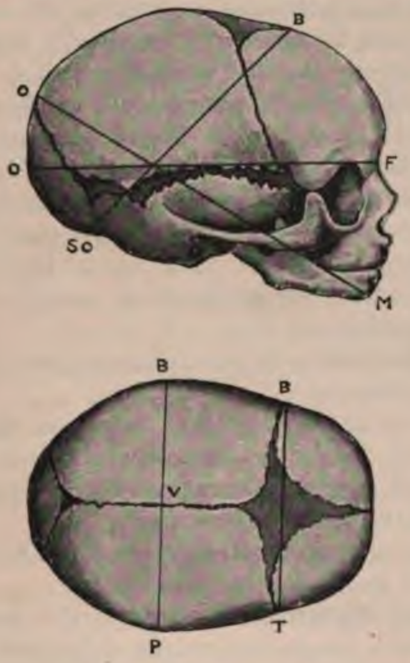


FIG. 4.—THE FŒTAL SKULL (FOTHERGILL).

O.M. = Occipito-mental diameter.
S.O.B. = Sub-occipito-bregmatic diameter.
O.F. = Occipito-frontal diameter.
B.T. = Bitemporal diameter.
B.P. = Biparietal diameter.
V. = Vertex.

Transverse Diameters.—The *biparietal* is measured between the widest parts of the parietals (3½ inches), and the *bitemporal* between the temples (2½ inches).

Vertical Diameters.—The *fronto-mental* is measured from the chin to the top of the forehead (3 inches), and the *cervico-bregmatic* from behind the angle of the jaw to the anterior fontanelle. The vertical diameters are the least important.

All these diameters can be considerably lessened by the moulding of the head during labour. By this I do not mean that they will all be lessened in each case, because, as a matter of fact, while some are lessened others must necessarily be increased. It will depend upon the way in which the head presents as to which diameter will be lessened and which increased. Some heads are broader than others, and do not mould so well, while others are much longer (dolichocephalic). The head of a male is usually slightly larger than that of a female. Among highly civilized races the heads are larger than among savages. This is one reason why labour among civilized women is much more difficult than among primitive people, and also why labour among savage women is much more difficult when the children are half-breeds.

Stages of Labour.—For convenience, labour is usually divided into three distinct stages.

The *first stage*, or that of dilatation, lasts from the commencement of true labour pains until the os uteri is fully dilated.

The *second stage*, or that of expulsion, lasts from the full dilatation of the os uteri until the child is born.

The *third stage*, or that of delivery, lasts from the birth of the child until the placenta and membranes are expelled.

Premonitory Symptoms.—During the last two or three weeks of pregnancy, the uterine tumour sinks, and allows of greater ease in breathing, but pressure upon the bladder and rectum will be increased, so there will be frequency of micturition, and an increase of constipation, and the patient may have some difficulty in walking, and her legs may swell somewhat from the increased pressure. This is known to women as "the lightening before labour."

The cervix becomes shortened, or taken up into the uterine cavity, by the gradual expansion of the lower uterine segment. At the same time there will be an increase in the mucous discharge from the vagina, which becomes blood-stained at the onset of actual labour, constituting what is known as the "shows."

Many patients are troubled with pains, especially at night, for the last two or three weeks. These are sometimes so bad that the patient imagines the labour has actually commenced. These pains are known as *false*, while the proper labour pains are known as *true* pains. It is important to be able to distinguish between them. True pains, or contractions, cause dilatation, and during their occurrence the presenting part will be felt to be forced down against the os; the bag of membranes will become tense. False pains have no effect in this way. They are generally caused by irritation in the bowels, or from an overdistended bladder, or from the patient being overfatigued, from standing too long. They recur at irregular intervals, and the uterus does not harden regularly, as when the true pains are on.

Diagnosis.—A vaginal examination during a false pain will show that the os uteri is not being dilated, neither is the presenting part being pressed down.

Treatment.—False pains do not assist labour. They cause much suffering to the patient, and should therefore be relieved. Remove the cause by attending to the bowels or bladder, and then give an opiate.

The First Stage of Labour.—*True pains* are first felt in the abdomen at intervals of perhaps half an hour or even longer. The word "pains" is used as synonymous with uterine contractions. At first the pains recur every half-hour or so, but as labour advances they become much more frequent: every fifteen or ten minutes, and then every five minutes, and finally every three or four minutes. Between the pains there is complete rest, and the patient will often drop off to sleep. This rest is a wise provision of Nature. If the pains were continuous, the woman would quickly become exhausted, and the fœtus would be killed by the continuous pressure. As they increase in strength and frequency, the patient begins to feel them in her back and shooting round towards the front. If you place your hand upon the abdomen during a pain, you will feel the uterus harden and come forward.

During the first stage the pain feels of a gnawing or grinding nature. Some women suffer greatly, while others again seem to suffer very little, and give practically no indication of what is going on, except perhaps by a drawing together of the face. Most patients are restless, and cry out a good deal. During this time canalization of the lower part of the uterus and cervix is taking place. The lower uterine segment stretches, and the membranes attached to it get separated, and project through the opening os, as the *bag of membranes* or *fore-waters*. The bag of membranes acts as a splendid dilator. It is usually rounded in shape, but it sometimes projects into the vagina in a sausage shape in cases of malpresentation or contracted pelves. Its power as a dilator is then very small. The contractions of the longitudinal fibres of the uterus tend to push the uterine contents downwards, and at the same time pull open the os.

If a vaginal examination is made during a pain, the bag of membranes will be felt to become tense and the lips of the cervix firm.

When the os is fully dilated, the membranes, as a rule, rupture, and the forewaters escape. The whole of the liquor amnii does not escape, as part of it is dammed back by the head plugging the cervix, but in transverse or breech cases the presenting part does not do this, so the whole fluid quickly escapes. Sometimes the membranes rupture early, even before the pains come on, while at other times they are so tough that they require to be ruptured artificially. There is occasionally a collection of fluid between the chorion and amnion, and the discharge of this may lead to the mistake that the membranes have ruptured, while in reality the amnion is still intact. Occasionally the ovum is expelled intact—*i.e.*, with the child completely enveloped in the membranes. They must be torn at once, or the child will be smothered. Sometimes the child is born with a cap of membranes over its head, known as a "caul." The well-known superstition as to this membrane has hardly yet died out among a certain class.

The Second Stage of Labour.—When the os is fully dilated and the membranes are ruptured, the second stage begins. The pains now become stronger and more frequent, and the head distends the perineum (Fig. 5). The suffering is greater, and, at the moment of expulsion of the child, may become so great that the woman may lose control of herself for a little, and can hardly be held responsible for her actions. The pain is of a rending, tearing nature, and will be specially felt in the back.

During the second stage the secondary powers come into play. The woman holds her breath and contracts her abdominal muscles as much as she can, in making expulsive efforts. This assists uterine action very markedly.

Third Stage.—After the child is born the uterus retracts and may remain quiescent for a few minutes, but contractions soon come on, and retraction increases until the placenta and membranes are separated and expelled. A primipara, as a rule, will not have any more pains after the expulsion of the placenta and membranes, unless a portion is retained *in utero*, but in subsequent labours they will continue for from twelve to thirty-six hours afterwards, and be especially severe when the child is at the breast.

Effect of Labour on the Child.—Until the membranes rupture and the liquor amnii escapes, the child does not suffer from pressure, as the fluid prevents this; therefore, as a rule, there is no pressure upon the child until the second stage, unless the membranes have ruptured prior to, or during, the first stage. If the second stage is too prolonged, there is considerable risk of the pressure killing the child. As has already been mentioned, the fœtal head moulds considerably when it is the presenting part. In difficult and prolonged labours the moulding will be marked. It occurs chiefly during the second stage.

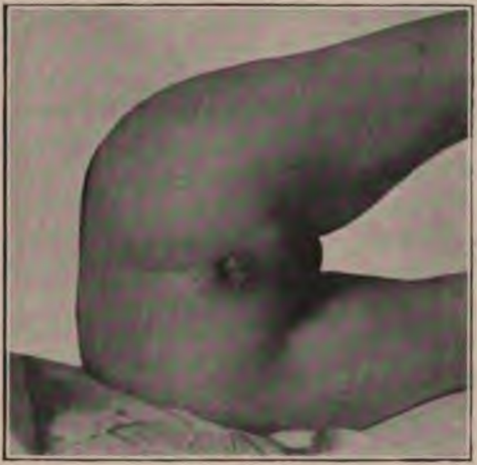


Fig. 5.—Head beginning to Distend the Perineum.

Caput Succedaneum.—Besides the moulding of the head there is always more or less swelling of the scalp, known as the *caput succedaneum*. This forms on the part which presents, or lies free in the os. This part is not supported, therefore the pressure from above forces the serum of the blood into it, and causes it to swell. The position of the caput succedaneum differs according to the position of the presenting part. We thus have several swellings, forming as the head changes position, during its movement through the pelvis, but finally they all come to be merged into one. In vertex presentations this is over the back part of the parietal bone, which lies to the front. When any part of the child, other than the head, presents, the swelling will, of course, be on the part which presents, and not on the head.

In a few days the head usually gains its normal shape and the caput succedaneum disappears, but, until it has disappeared, one can judge from it in what way the child has presented.

Duration of Labour.—A normal labour should not last more than twenty-four hours from the onset of true labour pains. Twelve hours is about an average duration. It is usually longer with first, than with subsequent children. Of the three stages, the first is much the longest, averaging about eight or ten hours, though it may be much longer or much shorter. During the first stage, so long as the membranes are intact, there is no risk to mother or child in ordinary cases. The second stage may last only a few minutes, but about three hours in multiparæ and four hours in primiparæ is as long as it should be allowed to last, provided the pains are active. If it is allowed to linger on for hours, the pressure upon the child may cause its death. The mother may become exhausted, and the soft parts in the pelvis may be so injured, by pressure from the presenting part, that sloughing will occur a few days later. In such a case the bladder or rectum, or both, may be opened into; septic absorption is also apt to occur.

The third stage is usually over in about fifteen or twenty minutes. If it is prolonged much beyond that, the placenta is in all probability adherent.

1. *Normal Labour.*—It is almost impossible to define what is meant by a *normal labour*. It may be looked upon as one in which the vertex presents, and the child is expelled by natural efforts within twenty-four hours, without anything untoward occurring.

2. *Laborious or Lingering Labour.*—This differs from a normal labour in being prolonged beyond twenty-four hours. The risk to both mother and child is considerably increased In labours lasting over twenty-four hours the mortality is four times greater than in those under twenty-four hours, while in those lasting over thirty hours it is twelve times greater. You see, then, that a laborious labour is a dangerous one, and the danger rapidly increases with the lengthening of the time,

3. *Preternatural Labour.*—In this form some part of the child other than the head presents. This includes breech and transverse presentations. It is a dangerous labour, especially in the transverse cases.

4. *Complex or Complicated Labours.*—In this form there is danger

to the mother and child, apart from that due to the presentation. The complication may be either fœtal or maternal. The fœtal complications may be from prolapse of the cord or multiple pregnancies. The maternal complications may be from hæmorrhage, cardiac or chest disease, eclampsia, malformations of the uterus, and rupture of the vagina and uterus.

5. *Missed labour*, where at full time labour has not come on at all, or, having commenced, the pains have subsequently passed off, and the fœtus is retained *in utero* for a considerable period.

The Mechanism of Labour.—To thoroughly understand *labour*, we must study the movements of the presenting part of the fœtus, as it passes through the pelvis. In 95 per cent. it is the vertex which presents, so we shall consider its movements.

The head may present in four different positions. The occiput is the part which leads, and is known as the *denominator*—*i.e.*, it denominates or gives the name to the presentation. The positions are named first, second, third, fourth, according to the way the occiput points. The first and second are anterior positions, and the third and fourth posterior.

First Position (L.O.A.).—In the first or left occipito-anterior position, which is the most frequent of all, the occiput points towards the left cotyloid foramen and the sinciput or forehead towards the right sacro-iliac joint. The occipito-frontal diameter of the head thus lies in the right oblique diameter of the pelvis (Fig. 6, I.).

Second Position (R.O.A.).—In the second or right occipito-anterior position, the occiput points towards the right cotyloid foramen, and the sinciput towards the left sacro-iliac joint. The occipito-frontal diameter of the head thus lies in the left oblique diameter of the pelvis (Fig. 6, II.).

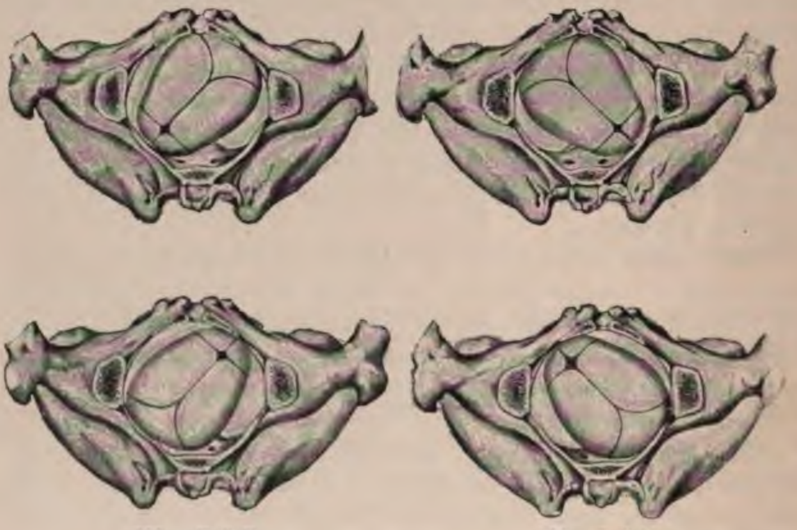
Third Position (R.O.P.).—In the third or right occipito-posterior position, the occiput points towards the right sacro-iliac joint and the sinciput towards the left cotyloid foramen. The occipito-frontal diameter of the head thus lies in the right oblique diameter of the pelvis. This is just the reverse of the first (Fig. 6, III.).

Fourth Position (L.O.P.).—In the fourth or left occipito-posterior position, the occiput points towards the left sacro-iliac joint and the sinciput towards the right cotyloid foramen. The occipito-frontal diameter of the head thus lies in the left oblique diameter of the pelvis. This is the reverse of the second (Fig. 6, IV.).

Frequency of Occurrence.—Of the anterior positions, the first (L.O.A.) is by far the more frequent, and of the posterior, the third (R.O.P.).

The third occurs more frequently than the second or fourth. The fourth is rare. Placing them in the order of frequency, we have the first, the third, the second, and then the fourth. As the first and third are by far the most frequent, it will thus be seen that in the vast majority of cases the head passes through the pelvis with its occipito-frontal diameter in the right oblique diameter of the pelvis. As I have already stated, this diameter of the pelvis is slightly longer than the corresponding left one.

Movements of the Head as it passes through the Pelvis in the First Position (L.O.A.).—The head, which is somewhat flexed on the chest, enters the pelvis or engages in the brim, with its occipito-frontal diameter in the right oblique of the pelvis, the occiput pointing towards the left cotyloid foramen, and the sinciput towards the right sacro-iliac joint, the right parietal bone presenting. The contractions of the uterus and abdominal muscles force the head downwards and backwards, through the cavity of the pelvis, in the right oblique diameter. This movement of *descent* is continuous throughout the other movements about to be described. The fœtus is developed in a flexed attitude, so at the beginning of labour the head is somewhat flexed on the chest. As soon as descent begins, and the



I.—L.O.A. II.—R.O.A.

III.—R.O.P. IV.—L.O.P.

FIG. 6.—DIAGRAM OF FOUR VERTEX POSITIONS FROM BELOW (CROOM).

head meets with resistance, *flexion* is increased, until the occiput gets considerably in advance of the sinciput. This is due to the steeper or occipital part of the head travelling quicker than the more sloping front part. The inward pressure from the sides of the canal tend to increase flexion when it has commenced. The result of flexion is to bring the suboccipito-bregmatic diameter of the head into the oblique diameter of the pelvis, in place of the occipito-frontal—*i.e.*, to substitute a short diameter for a much longer one, which will allow the head to pass more easily. The movement of *flexion* is a very important one, and, the more marked it is, the more easily will the head pass down.

When the flexed head has passed down through the cavity of the pelvis, the leading part of it—viz., the occiput—impinges against the pelvic floor, and we then have the next movement—viz., *internal rotation*. The occiput turns forward—*i.e.*, towards the right, under the pubic symphysis. This is caused by the elastic resistance of the pelvic floor forcing the occiput in the only direction in which it can go—viz., forward to the vulvar opening. The rule for internal rotation is, that the leading part of the child—*i.e.*, the part which strikes the pelvic floor first—must go forward. This holds good, no matter what the presentation may be. The result in this case is that the suboccipito-bregmatic diameter of the head changes from the right oblique diameter of the pelvis into the conjugate at the outlet—*i.e.*, into the longest diameter at the outlet, which of course allows of the head passing more easily.

When the occiput comes under the pubic symphysis, the nape of the neck fits well into the arch, and then we have the next movement of *extension*. It is the undoing of flexion. The chin gradually leaves the chest, but at the same time the nape of the neck glides under the symphysis, so that there is a movement forward, as well as a bending back, of the head. In this way the top of the head, the forehead, and then the face, of the child are forced over the perineum, and the head is born. Extension is the result of the force from above driving the head downwards, while the perineum resists, so the head must pass forwards in the line of the resultant of the two forces—*i.e.*, in the axis of the outlet.

The next movement is known as *external rotation* or *restitution*. The head turns round so that the face of the child, which was looking directly towards the mother's anus, comes to look towards her right thigh, or directly upwards, when the patient is lying in the usual position on her left side. The head has nothing to do with causing this. It is really an internal rotation of the shoulders, the leading shoulder following the ordinary rule of internal rotation, and passing forward under the pubic arch just as the occiput did, but in the opposite direction—viz., towards the left. The posterior shoulder now sweeps over the perineum, and both shoulders and arms are born. The body is then expelled without any difficulty, as a rule.

To recapitulate: we have flexion, descent, increase of flexion, internal rotation, extension, and, finally, external rotation and birth of the body.

Mechanism in the Second Position (R.O.A.).—The occiput points towards the right cotyloid foramen, and the sinciput towards the left sacro-iliac joint—*i.e.*, the occipito-frontal diameter of the head lies in the left oblique diameter of the pelvis. The left parietal bone presents. The movements of the head are precisely the same as in the first position—viz., flexion, descent, increase of flexion, internal rotation, extension and external rotation. The only difference is that the head descends in the left oblique diameter of the pelvis, and, as the occiput rotates forward, it must turn towards the left. In external rotation the face turns to look towards the mother's left thigh, or directly downwards towards the bed.

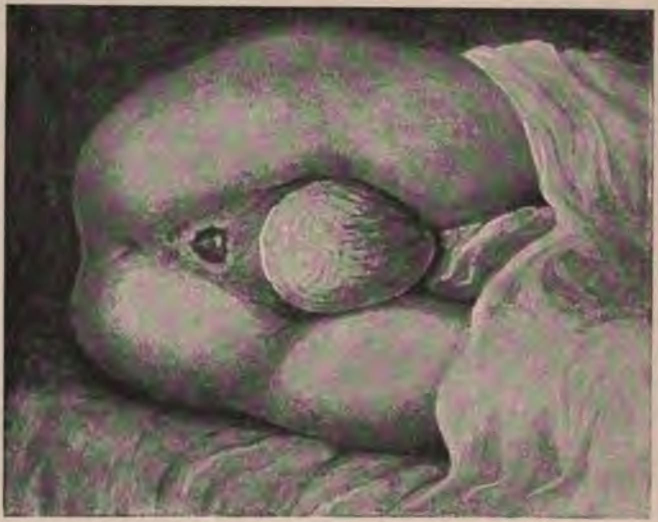


FIG. 7.—BIRTH OF THE HEAD (FOTHERGILL).

The mechanism in occipito-posterior cases will be dealt with later on, when we consider the treatment of such cases.

Mechanism of the Third Stage.—During the third stage of labour the placenta and membranes are separated and expelled. The placenta, which is from 6 to 8 inches in diameter, is attached to a portion of the uterine wall of corresponding size. The exact position of the attachment varies, but, to be normal, it should be somewhere in the uterine cavity above Bandl's ring. When the child is born, the size of the uterus is much reduced by retraction or permanent shortening of the muscular fibres, and the site of attachment of the placenta shrinks with the rest of the wall. With each contraction during the third stage, more and more retraction occurs, and the uterus becomes smaller and smaller. The placenta itself cannot shrink very much ; and, as its site does, separation necessarily occurs. The membranes are separated in the same way. When separation has occurred, the uterine contractions expel the placenta into the vagina, and its birth is completed by the expulsive powers of the abdominal muscles. It may come edgewise or doubled on itself. The membranes follow it. More or less clot comes with the placenta.

CHAPTER XII

THE MANAGEMENT OF AN ORDINARY LABOUR

Armamentarium—Arrangement of the Bed—External Examination of the Patient—Inspection, Palpation, and Auscultation of the Abdomen—Vaginal Examination—The First Stage—The Second Stage—The Third Stage.

To insure success in surgical work, absolute cleanliness or asepsis is necessary. This is equally true of midwifery work, and the sooner this is realized the sooner will the death-rate from puerperal sepsis be materially lessened. In my introductory chapter I have dealt shortly with this subject, so I shall not elaborate it further, but shall describe the methods which I have found most successful in conducting my midwifery work.

Before taking up the consideration of how to manage an ordinary labour, let us consider our **armamentarium.** If a midwifery bag is used, it should be of fair size, and have a removable canvas lining, fitted with loops for bottles. This lining should be sterilized from time to time. A much better appliance is a midwifery satchel like Ballantyne's (Figs. 8 and 9). It consists of two tin trays, one fitting partly into the other. In the shallower, and lower, one there is a canvas tray with compartments for the various bottles, etc., and in the upper one the forceps, douche, etc., are carried. The whole is enclosed in a removable canvas cover, with a strap and handle for carrying it. If the case is an instrumental one, you lift the canvas tray out of the lower tray, and you have an admirable sterilizer for your instruments, which you can use on an ordinary fire or gas-stove. The water should be cooled down by adding sterilized water, and a little lysol to lubricate your instruments. You thus insure asepsis as regards the instruments. The upper tray is large enough to allow of soaking your hands and forearms in an antiseptic solution, and it may also be used for bathing the child if resuscitation is necessary. In working among the poor you often have great difficulty in obtaining proper basins and jugs, and when you do get them you can never be sure they are clean; but with these trays you are independent, and it is your own fault if they are not perfectly clean. I have found this satchel most useful, and as regards the cost, it is cheaper than a fitted-up bag.

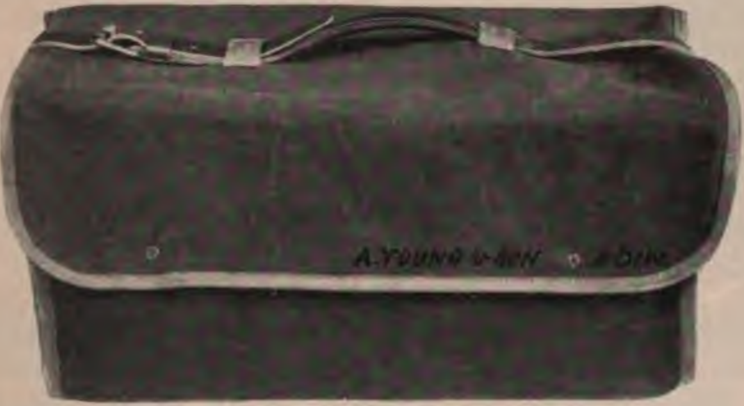


FIG. 8.—BALLANTYNE'S OBSTETRIC SATCHEL.

CONTENTS.

1. A good pair of all-metal long forceps. Milne-Murray's axis-traction ones I consider the best yet produced.

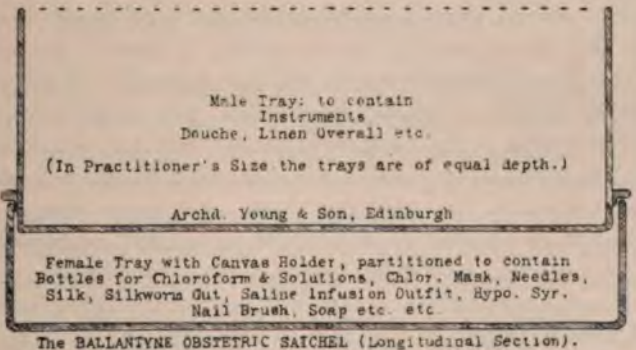

Male Tray: to contain
Instruments
Douche, Linen Overall etc.
(In Practitioner's Size the trays are of equal depth.)
Archd. Young & Son, Edinburgh
Female Tray with Canvas Holder, partitioned to contain Bottles for Chloroform & Solutions, Chlor. Mask, Needles, Silk, Silkworm Gut, Saline Infusion Outfit, Hypo. Syr. Nail Brush, Soap etc. etc.
The BALLANTYNE OBSTETRIC SATCHEL (Longitudinal Section).

FIG. 9.—BALLANTYNE'S OBSTETRIC SATCHEL.

2. A douche with a long curved, channelled, glass nozzle. A rubber bag douche which will hold 5 pints is the most convenient of all.

3. A Higginson's syringe for giving enemata only.

4. A long silver or glass catheter.

5. An antiseptic. Lysol is the most convevient, as it does away with the need of a greasy lubricant. Perchloride of mercury pellets may also be carried, but except for sterilizing one's hands they are not to be used in an ordinary labour.

6. Chloroform.

7. Ergot, but ergotin or ergotinin for hypodermic use is of much greater value.

8. Clean nail-brush.

9. Scissors, curved needles, needle-holder, silkworm gut, and catgut.

10. A small packet or two of absorbent wool. Very convenient ounce packets of this are now supplied by chemists.

11. A large sterilized waterproof apron, or an aseptic cotton overall.

Besides these it is well to carry a small bottle of ether and an opiate in one form or other, and a hypodermic syringe with tabloids of ergotinin, morphia, and strychnine. To arm one completely for emergencies, a packet of iodoform or sterilized gauze, a pair of packing forceps, a pair of volsella forceps, and a saline infusion apparatus would be necessary.

When labour begins, you should attend as soon as sent for. On arrival, inquiries should at once be made as to the nature of the pains, how long they have been going on, and how frequently they are recurring, and also if there has been any discharge. If the patient is not in bed, she should go there, to enable you to examine her.

The proper arrangement of the bed is of great importance. If there be a trained nurse in attendance she is of course responsible for this, but many patients cannot afford to have a proper nurse, and in this case you must see to the bed yourself. If possible, the bedstead should be so placed as to allow you to get round it. A firm hair mattress is the best form of bed, but you must make the best of whatever is at hand. A mackintosh sheet is usually put over the bed, then the ordinary sheet, and above that a smaller mackintosh with a folded up draw-sheet or blanket, or, what is much better, an obstetric bed sheet (gamgee tissue does nicely for this). In many cases mackintosh sheets will not be available, but several plies of brown paper, or ordinary newspapers, make a very good substitute. The draw-sheet, at least, should be perfectly clean. Among the poorer classes it is usual for the patient to have on a dirty petticoat, and perhaps soiled underclothing and nightdress. The petticoat should be removed, and the underclothing and nightdress replaced by clean ones, which should be well tucked up, so as to prevent the bottom part becoming soiled. It is quite impossible to conduct a labour aseptically if the surrounding clothing is in the filthy condition that it too often is.

EXAMINATION OF THE PATIENT.

Where it is possible, the patient should be seen some days before the labour is due, and the presentation of the fœtus should be made out by palpation of the abdomen. As a rule, a vaginal examination will not be necessary, but if any abnormality as regards the pelvis is suspected, a thorough examination should be made, if necessary under chloroform.

External Examination of the Patient.—Your hands and forearms should first be thoroughly washed with warm water and soap. Particular attention must be paid to the finger-nails. When the hands and forearms are thoroughly clean, they should be soaked in an antiseptic solution for several minutes. Corrosive sublimate solution (1 to 1,000) is the most powerful, but a 1 per cent. lysol one does admirably.

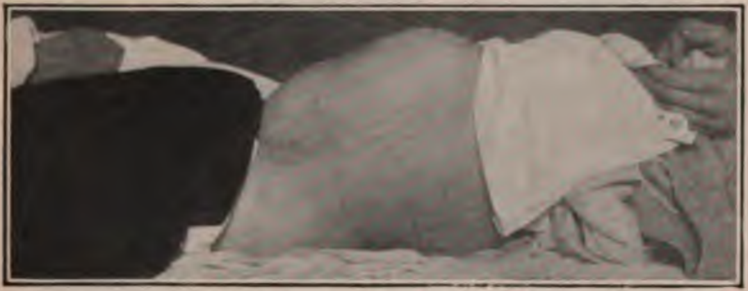


FIG. 10.—DISTENDED BLADDER.

Inspection.—The patient should lie flat upon her back, with the legs extended, her nightdress well rolled up, and the bed-clothes folded down so as to expose the abdomen from the ensiform cartilage to just above the pubic hairs. A careful inspection will at once reveal whether or not the contour is normal. If the lower part shows a somewhat globular swelling in addition to the uterine tumour, you should at once suspect that the bladder contains a considerable amount of urine (Fig. 10). Get the patient to pass her urine, as a distended bladder will interfere with palpation.

Auscultation.—The heart-sounds should be carefully listened for, and the position of greatest intensity noted, as this will, as a rule, give you a guide as to where the back of the fœtus is lying. The rate of the fœtal heart should be noted, because in a prolonged labour a change in the rate indicates danger to the fœtus, and is a warning that, in the interests of the child, speedy delivery is called for. If you hear the fœtal heart distinctly, tell the patient that the child is alive, but if you cannot make it out, tell some responsible person that you fear the child may be dead, but do not let the patient know this. If the child is born dead, no blame can be attached to you if you have announced beforehand that you could not detect life in it.

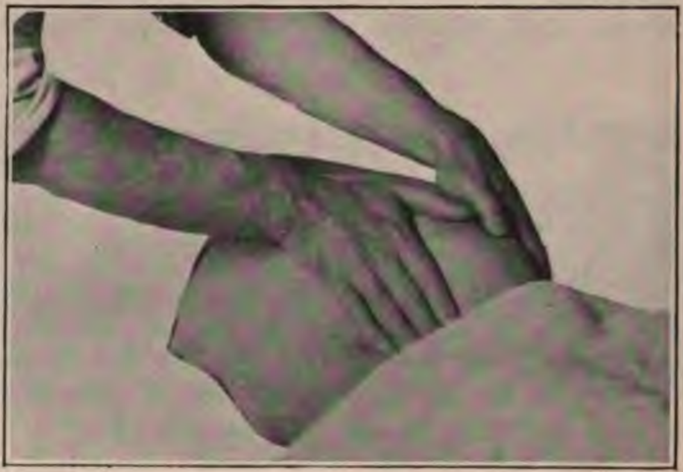


FIG. 11.—PALPATING THE PRESENTING PART.

Palpation.—You now proceed to a systematic palpation of the abdomen, but, before touching the patient, make sure that your hands are quite warm. If they are cold, it will not only cause the patient discomfort, but she will contract her abdominal muscles so firmly that you will not be able to feel the fœtal parts. You should stand facing the foot of the bed. Place both hands flat upon the lower part of the abdomen, and with firm, equable pressure steadily sink the tips of the fingers downwards and inwards, so as to grasp the presenting part of the child (Fig. 11). In this case it should be the head which you should feel as a hard globular mass, joined to the trunk by a narrower portion, the neck. If the patient is a multipara, as a rule the head will be felt above the brim in the early stage of labour, but, if she is a primipara, it should be engaged in the brim of the pelvis and more or less fixed. In either case, if it is above the brim it will be somewhat movable, and can be easily grasped with one hand (Fig. 12). With a primipara at full time, if the head is freely movable above the pelvic brim, you should at once suspect that there is a disproportion between the size of the head and brim. The probability is that you have either to deal with a large head or a contracted brim. When the head is well engaged you can only grasp its base. The occipital end of the head will be deeper in the pelvis than the sincipital, showing that flexion has taken place.

When you have made out the presenting part, you place your hands higher up on the abdomen, and feel for the rounded back on one side, and the limbs on the other (Fig. 13). In the great majority of cases the back will be to the left side. It is recognised by its smoothness, and the limbs by their unevenness. If the back is deeply situated, and the limbs are well to the front, the position of the child will be occipito-posterior, while, if the opposite maintains, the position will be occipito-anterior. The latter is, of course, by far the commoner position. If the abdominal wall is very thick, or if there is much liquor amnii in the uterus, you will have considerable difficulty in making out the different parts, but in most cases you can gain a good idea of how the fœtus is lying.

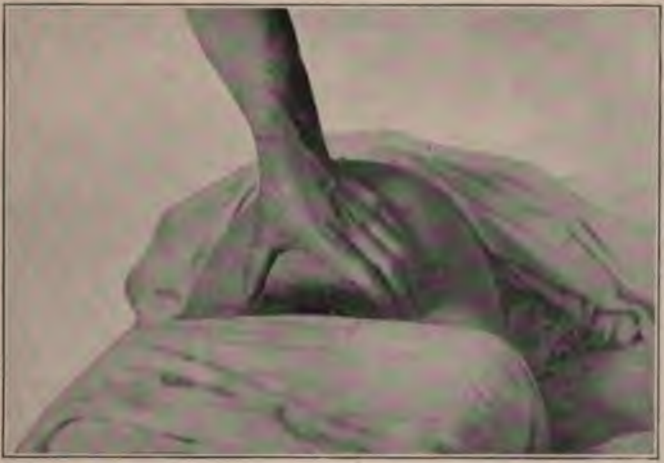


FIG. 12.—GRASPING THE PRESENTING PART WITH ONE HAND.

You next proceed to palpate the fundus, and to do so you face towards the head of the bed, and place your hands on either side of the upper part of the uterus (Fig. 14). The breech will be felt to be softer than the head, and not so rounded, and there will be no indication of a neck.

Besides making out the presentation and position of the fœtus, you will be able to form an estimate of its size, the amount of liquor amnii in the uterus, and whether or not active contractions are going on. You will also probably feel the fœtal movements.

Some obstetricians maintain that by palpation and auscultation you can learn all that you require to know without making a vaginal examination. An expert in palpation may be able to conduct a large number of his labours without making a vaginal examination, but even he may be at fault at times, as there are certain conditions which the most careful palpation will not reveal. The following case is an illustration:

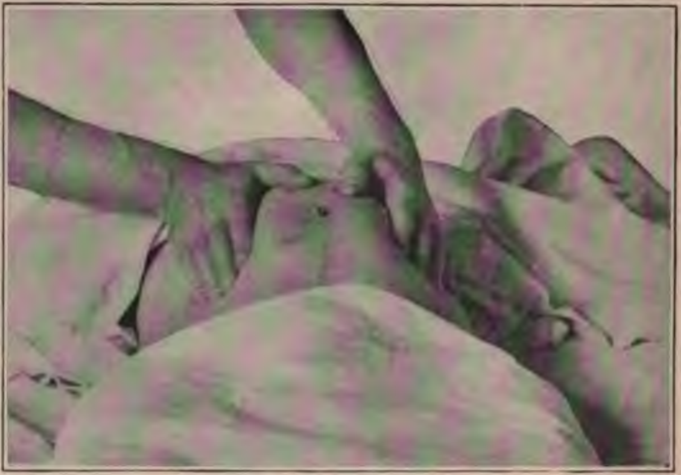


FIG. 13.—FEELING FOR THE BACK AND LIMBS OF THE FŒTUS.

CASE.—I was called to a primipara who was in labour. Palpation of the abdomen revealed that the head was engaged in the R.O.A. position. The pains were strong, and the membranes had recently ruptured. The vaginal examination revealed that a loop of the cord was prolapsed, and was being compressed by the head. I at once took steps to deliver the child with forceps, and saved its life, but if I had depended upon palpation I would have assuredly lost that child. I therefore maintain that a vaginal examination is necessary, and if it is done with proper aseptic precautions there is no risk to the patient. To minimize the risk of vaginal examinations, the use of aseptic rubber gloves is strongly advocated by some accoucheurs, but I do not think they are necessary if proper care is taken to thoroughly cleanse the hands. I use them in septic cases to protect my hands from contamination, and I think it is wise to do so, but in ordinary cases I prefer the bare hands. There is this, however, to be constantly borne in mind: that it is not only necessary to sterilize the hands, but you must also thoroughly cleanse the external genitalia of the patient, or you will inevitably convey septic material into the vagina. If the field of operation is rendered clean, and the hands are sterile, there will be no risk, but unfortunately the cleansing of the field of operation is a point which many accoucheurs neglect.

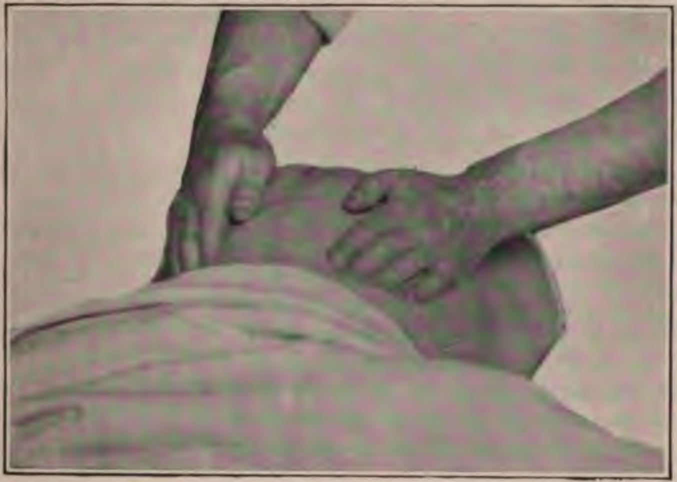


FIG. 14.—PALPATING THE PART OF THE FŒTUS AT THE FUNDUS.

Vaginal Examination.—The hands should again be thoroughly sterilized, and the external genitals of the patient cleansed with an antiseptic. For this purpose there is nothing better than a 1 per cent. solution of lysol. A properly trained nurse will do this in preparing her patient for you, but, if you have no nurse, do it yourself. Use swabs of absorbent wool, and not an ordinary sponge. This proceeding has been objected to on the ground that patients will not submit to it. I have never found this to be the case, and if a patient should object, I am confident a few words of explanation would remove all scruples. With the patient lying on her left side there is very little exposure. When the parts are clean, the examining hand should be soaked in the lysol solution, and the finger or fingers passed into the vagina without touching anything before being inserted. If lysol is used, there is no need of a greasy lubricant. It is a well-known fact that the majority of so-called antiseptic lubricants are far from being aseptic, and there must therefore be danger in introducing them into the passages, especially into the uterus, on instruments. Begin the examination before the onset of a pain, and continue it during the pain. You make out if she is in labour, the stage it has reached, the condition of the membranes, the presentation and position of the child, and the state of the passages. If the os is not fully dilated, and if the membranes are intact, be careful not to rupture them. If everything is right, tell the patient; but if you find anything abnormal do not alarm her, but tell some responsible person. You are sure to be asked if the labour will be long, but be careful not to commit yourself to any definite time, as the patient will lose confidence in you if the time is exceeded.

See that the attendant has ready plenty of hot water, towels, a binder, napkins (wood-wool or gamgee ones preferably), ligatures for the cord, clean sheets, and a change of clothing for the patient, as well as the baby's garments. Everything should be well aired before the fire.

The First Stage.—If the labour is not very far advanced, and the bowels have not been freely moved, an enema of soap and water, with some castor oil added, should be given. It is well to see to this yourself if there is no nurse. In the early stage the patient may be left, with instructions that you are to be sent for as soon as the waters come away. If the os is the size of a crown, and the pains are at all active, you had better stay in the house, but not in the patient's room. She may be allowed to move about the room during the first stage, but tell her not to bear down. In an ordinary case you will not require to examine again until the membranes have ruptured. If the patient is up when this occurs, she should be put to bed at once. The external genitals should be again cleansed with lysol solution, and the hands sterilized as before, prior to the vaginal examination. It is important to examine immediately after the membranes rupture, for fear the cord may have been swept down by the rush of waters. External palpation will not reveal this, and if it has occurred prompt treatment will be required to save the child.

If the cord cannot be replaced, you should either turn or apply forceps, unless you see the child is likely to be expelled immediately. Interference will usually be necessary, and the sooner it is done the better the chance of saving the child. Before the membranes rupture there is practically no danger to either mother or child in ordinary cases, but as soon as the liquor amnii drains away risk to both begins.

The Second Stage has now commenced, when the os is fully dilated and the membranes have ruptured. The patient must keep in bed, and she should be encouraged to bear down as much as possible. The pain in her back may be eased by firm pressure. If the suffering is very great, a little chloroform may be given during the pains. When the head begins to bulge the perineum it may be necessary to give more chloroform. The chloroform interferes somewhat with the uterine contractions, and, if much is given, it abolishes the voluntary contractions of the abdominal muscles, but on the other hand it relieves the patient's sufferings, and relaxes the passages. If the perineum is rigid, hot fomentations may help to relax it. When the head begins to bear upon the perineum, the right thigh should be supported. Supporting the perineum often does more harm than good, but some good may be done by putting your right hand flat over the anus, with your fingers on one side of the vulva, and your thumb on the other, then push the whole structure forwards, in the direction the head is passing. A pledget of absorbent wool, wrung out of lysol, should first be placed over the anus to pre-

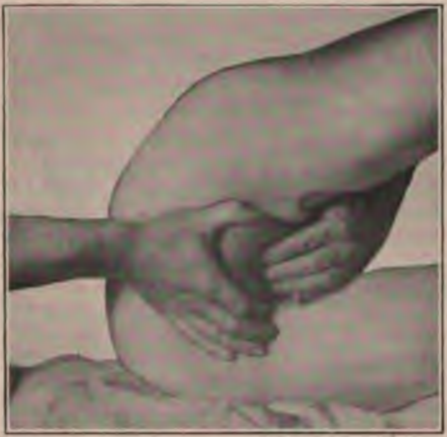


FIG. 15.—METHOD OF SUPPORTING THE PERINEUM.

vent the hand being soiled. The left hand should at the same time be passed between the thighs from the front, so as to keep the head flexed as much as possible. The tips of the fingers are pressed firmly against the part of the head in front of the posterior commissure at first (Fig. 15), and finally the head is grasped with the thumb behind the symphysis (Figs. 16 and 17). The perineum should not be stripped back over the forehead, as this is sure to tear it. The more the head is flexed the smaller its diameter will be, and the less the strain on the perineum. Lateral incisions are advised by some, but I do not recommend them. As soon as the head is born, feel if the cord is round the neck, and, if it is, slip it over the head or shoulders. If it is too short to allow of this, cut it and deliver quickly. You may tie it in two places and cut between, but if you cannot do this, secure the end attached to the child as soon as the trunk is delivered. Do not hurry the birth of the trunk unless there is some reason for doing so, and try to prevent the shoulders from tearing the perineum. Do this by pressing the body well against the symphysis pubis. If care is not taken, a slight tear made by the head may very easily be increased. The left hand should follow the fundus down as the body is being expelled. If you cannot do this, get the attendant to do it.

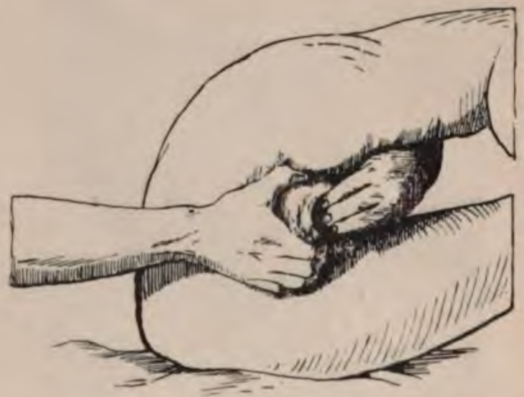


FIG. 16.—METHOD OF SUPPORTING THE PERINEUM; FLEXING AND RETARDING THE HEAD.

The child's eyes should be wiped at once, and all mucus freed from the mouth. It will usually cry, but if it does not, lift it up by the feet, and give it a smart slap or two on the buttocks. If this does not suffice, artificial respiration will be necessary. As soon as it has cried freely, or at once if artificial respiration is necessary, tie the cord in two places, 2 inches and 4 inches from the abdomen, and cut between. The second ligature may be placed close to the vulva. A stout thread ligature is the best, and be sure it is tied tightly. Cut the cord on the palm of your hand, for fear of wounding any part of the child.

The Third Stage.—While you are attending to the child the attendant should have her hand on the abdomen kneading the uterus gently. The patient should now lie on her back. Keep up this gentle kneading for a little, and you will usually feel the uterus contract, and expel the placenta into the vagina. When the placenta has slipped out of the uterine cavity into the cervix and upper part of the vagina, the fundus will rise a little in the abdomen. You now press firmly downwards and backwards, and expel it from the vagina. The membranes are usually removed by twisting them, but by grasping them between the finger and thumb, and making gentle traction upon them, you will be able to tell whether they are peeling off completely or tearing. Examine the placenta and membranes carefully, and if everything is not complete, explore the uterus at once and clear it thoroughly. A small tag of membrane left behind may not cause any mischief, but a bit of placenta certainly will, so it must be cleared out at once. If the placenta does not come away in fifteen

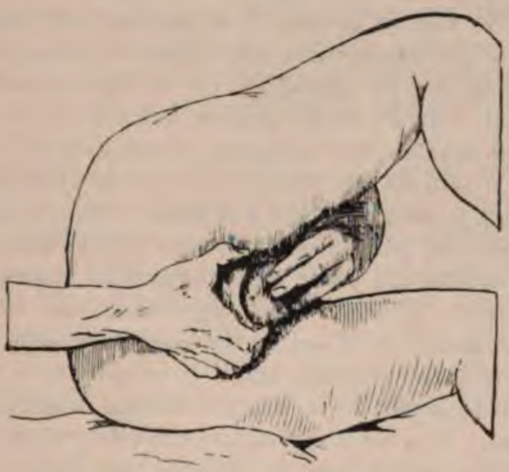


FIG. 17.—METHOD OF SUPPORTING THE PERINEUM; FINAL STAGE.

or twenty minutes, try to expel it by firm pressure downwards and backwards. If this is of no avail, after half an hour or so, introduce your aseptic hand, and peel the placenta off and remove it. This can be done without chloroform, but it will cause great pain. If the hand has to be introduced, an intra-uterine douche should be given immediately afterwards. This will wash out all the débris and check post-partum hæmorrhage.

Of late there has been a tendency to advocate immediate removal of the placenta, and some have even advised doing this by traction on the cord. I must enter a strong protest against such proceedings. The placenta may be removed from the vagina by traction on the cord, but it should never be torn off the uterus and dragged out in this way. The natural process of separation and expulsion of the placenta from the uterus takes some time. We may assist this by gentle kneading, but we should not try to hurry matters too much. If Nature fails, then we must interfere, but only then.

You should examine the perineum immediately after the child is born. If it is torn to any extent it should be stitched. This may be done at once to save time, but it is better to wait until the placenta is away. Silkworm gut is the best suture for the deep stitches, and they should include the whole tear. Superficial catgut ones may be necessary as well. In slight tears catgut alone may be used. Tears in the vagina should be closed at the same time with catgut. As a rule the cervix is not stitched, but if it is badly torn this should be done. It can be drawn down, and the stitches of silkworm or catgut easily inserted. It is not a sign of bad midwifery to have a perineum to stitch, but to leave it torn, in the hope that Nature will repair it, deserves the strongest condemnation. The man who boasts that he has never had to stitch a perineum may lay to his soul the flattering unction that this is due to his skill as an obstetrician, but some of his patients will have a different story to tell.

The patient must now be cleansed and all the soiled things must be removed. Wash her thoroughly with the lysol solution, using swabs of absorbent wool and apply an aseptic diaper. Put a clean, well-aired draw-sheet under her. If there is no trained nurse present, do the cleansing yourself, and trust to no ordinary attendant. If the uterus is well contracted, and there is no hæmorrhage, a firm binder should now be applied. The lower part of it should grasp the trochanters. The binder should never be applied until the uterus is well retracted. If it tends to relax, keep kneading it until it becomes firm and remains so. Pads are sometimes applied over the uterus, but they are almost sure to shift, and do more harm than good. If the patient's nightdress is soiled, have it changed at once.

Formerly routine douching was advised in all cases. In ordinary labours which have been properly conducted, douching is unnecessary. It will probably do more harm than good. If the parts are perfectly aseptic it will not improve matters; in fact, it will do positive harm by washing out the protective organisms.

Some obstetricians advise giving ergot in all cases, but this is not necessary unless there is hæmorrhage or the uterus remains flabby. It should never be given until the placenta is away.

After the patient has rested a little, she should be given some slight nourishment, such as a cup of tea. In ordinary cases stimulants are not necessary, either during or after the labour, but if the labour has been at all prolonged she should have had some nourishment, such as a cup of beef-tea or of extract of meat, during the time. In a few hours the child may be put to the breast. This encourages contraction of the uterus.

Before leaving her, see that the pulse is slow, the uterus well contracted, and the discharge normal in quantity. It is often stated that the pulse falls below normal immediately after labour, but this is not the general rule. It should slow down, but it seldom falls below normal. If you find it has risen, at once be on your guard against post-partum hæmorrhage.

CHAPTER XIII

THE PUERPERIUM—CARE OF THE MOTHER AND CHILD

Involution of the Uterus—The Lochia—Rate of Involution—Subinvolution—Superinvolution—Care of the Mother during the Puerperium—After-pains—Evacuation of the Bowels—The Diet—Pulse and Temperature—The Breasts—Length of Time in Bed—Care of the Child—Dressing the Cord.

THE *puerperium* includes the time from the completion of labour until the organs of reproduction return to their normal state. This takes from six to eight weeks. For the first two weeks or so the woman should keep her bed, and until involution is completed she should take care not to overexert herself. Working-class women generally rise too soon, and exert themselves too much, and as a consequence many of them suffer from subinvolution and prolapse of the uterus.

On the completion of labour the uterus is about 7 inches long and weighs about 2 pounds. It has to diminish to 3 inches in length, and to a little over 1 ounce in weight. Besides the uterine body, the surrounding parts, such as the ligaments, ovaries, tubes, cellular tissue, and vagina have all to undergo a process of involution, so that there is a large amount of material to be got rid of. It must also be borne in mind that other organs besides those of generation have increased in size during pregnancy, and that they too must involute. The heart may be taken as an example. At the end of pregnancy the left ventricle has increased in thickness, but on delivery the extra strain on the circulation is removed, and, as it is no longer required, the compensatory hypertrophy will at once begin to disappear. A large amount of subcutaneous fat is often put on during pregnancy, and it usually rapidly disappears during the puerperium.

Involution of the Uterus.—The process is essentially one of fatty degeneration and absorption of the redundant tissue of the muscular and peritoneal layers of the uterus. It has been maintained that there is a complete destruction of the uterine muscular fibres, and a new development from embryonal cells in the outer layers, but more probably it is only a partial degeneration. On the other hand, Fischel holds that the muscle-cell contents are converted into a peptone, absorbed into the blood, and discharged through the kidneys, giving rise to peptonuria.

The involution of the endometrium differs in so far as it is not absorbed, but cast off in the lochial discharges. At birth, separation of the decidua takes place through the spongy layer, leaving behind on the uterine wall the deeper cellular layer and the ends of the glands of the uterine mucous membrane. The obliteration of many of the bloodvessels cuts off the nourishment, and this layer of cells undergoes fatty degeneration, and is discharged in the lochia. When this layer is cleared away, a process of reproduction of the endometrium begins from the epithelial cells of the ends of the glands and the interglandular connective tissue, until ultimately a new mucous membrane is formed. By the end of two months this process will be complete.

As I have already mentioned, changes occur in the ligaments, ovaries, tubes, cellular tissue, and vagina, as well as in the uterus. The process in some of these structures will be partly one of retraction of overstretched tissue, but there will also be degeneration and absorption where there has been hypertrophy.

While involution is going on, and more especially during the first ten or twelve days, a very large amount of absorption is taking place. While this is strictly a physiological process, it approaches dangerously near the pathological, and very little may upset the balance.

The Lochia.—The discharges which come from the genital canal during the puerperium are known as the lochia. For the first five days or so the discharge consists largely of blood from the various vessels which have been torn across by the separation of the placenta and decidua, and also from any small tears which may have occurred in the cervix or vagina. It may contain clots, especially during the first day. From its colour it is known as the *lochia rubra*. For the next two or three days it is serous in nature, as the oozing of blood should now have ceased (*lochia serosa*). This is followed by the *lochia alba*, which consists of the débris of decidua and blood-clot from the interior of the uterus, along with dead tissue and pus from the injuries to the cervix and vagina. Mingling with the whole there will be a large amount of mucus. Micro-organisms of a non-pathogenic nature will be found in it; they are the vaginal bacteria. This discharge lasts from one to two weeks or even longer.

The amount of lochia varies considerably in different women. For the first three or four days it is much more profuse than later. For practical purposes, the amount may be estimated by the number of napkins required. For the first few days six per day should be sufficient. The amount gradually decreases, but it should continue to flow for about three weeks. A sudden cessation of it indicates that there is something wrong. If the *lochia rubra* continues too long, or recurs after several days' cessation, in all probability there is something retained *in utero*—a piece of placenta or membrane.

The discharge has a heavy odour peculiar to itself, but it should not be fœtid. When it is exposed to the air it soon becomes septic, hence the great necessity of receiving it into aseptic or antiseptic pads, which, when soiled, should be removed and burned. For the same reason the external genitals must be frequently cleansed with an antiseptic lotion, and no soiled draw-sheets or clothing allowed to lie under the patient.

Rate of Involution of the Uterus.—During the first ten days the rate of involution is rapid, and it can be accurately gauged each day by measuring the height of the fundus. The usual method is by daily noting the relation of the fundus to the umbilicus, but this is far from being accurate, as the position of the umbilicus varies very much in different women. From a large number of observations, I have found that in the majority of cases the umbilicus is 7 inches above the top of the symphysis pubis, but in a good many it varies from 5 to 8 inches, so that it is anything but a fixed point to measure from. This variation is not due to variation in the size of the women, as one might expect. The top of the symphysis pubis is a fixed point from which accurate daily measurements can be taken, and by keeping a record of these we can watch the progress during the first ten days. By the end of that time the fundus has reached the brim of the pelvis, and no further measurements can be taken. The progress is now slower, but it should go on steadily, until the uterus is back to its normal size. Care must be taken to have the bladder and rectum both empty when the measurement is made, as otherwise the uterus will be pushed up.

Immediately after labour the top of the fundus should be, on an average, from 6 to 7 inches above the symphysis. Within the first twelve hours or so it usually rises from ½ to 1 inch, and then falls more or less steadily at the rate of about 1 inch in twenty-four hours. By the tenth day the fundus should be about the brim of the pelvis.

The axis of the uterus is not usually in the axis of the abdomen, but towards one or other side, more frequently towards the right than the left. Rotation is also very common, usually from left to right. A full bladder or rectum will increase the deviation.

The rate of involution may be very conveniently depicted on the ordinary temperature chart by taking the 100° line to represent the top of the symphysis and counting each degree as an inch. If each day's height is marked in, and the dots are connected by lines, we have an involution curve above the temperature curve, and we can thus study the relationship between them. This is of great importance, because, as we shall shortly see, when sepsis occurs involution stops, and the fundus often rises, so that both curves will rise together (Figs. 18 and 19).

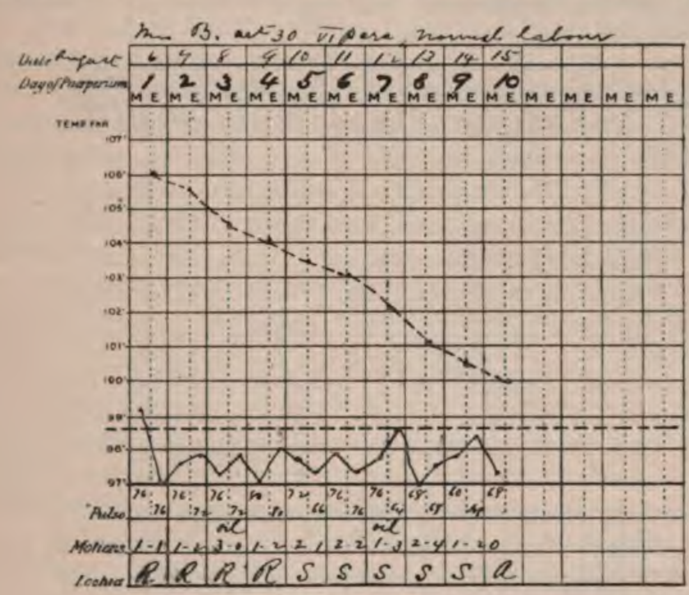


FIG. 18.—NORMAL INVOLUTION.

If the uterus is quite emptied, and the woman healthy and able to nurse her child, involution should be steady and satisfactory.

Subinvolution.—Here the uterus does not return to its normal size within the usual time. There are many causes for this, such as sepsis; the retention of something *in utero*—these two are often combined; the presence of fibroids in the wall; lacerations of the cervix; displacements, generally caused by rising too soon; failure to nurse; certain diseases of the liver; chronic valvular disease of the heart, and chronic constipation.

Superinvolution.—This is an exaggeration of the process, whereby the uterus becomes smaller than normal. The causes are not exactly understood. It may arise in cases of wasting disease, such as phthisis, cancer, and anæmia, after a rapid succession of labours, from prolonged lactation, and after an inflammatory attack of the ovaries which has interfered with their functions. It also seems to be common in cases of puerperal insanity.

Care of the Mother during the Puerperium.—This part of obstetric work is peculiarly the nurse's, but that does not mean that the doctor's responsibility is in any way lessened. If anything, it is increased, because he is not only responsible for his own deeds, but also for those of a woman, who may, through carelessness or ignorance, completely undo all the good that he, by his aseptic precautions, has done. A well-trained, conscientious nurse is a treasure, but, on the other hand, a badly-trained, presumptuous woman, who does things on her own responsibility, is a terror. In the cases where no nurse is in attendance, you have to instruct the attendant what she is to do, and above all what she is not to do. Sins of commission are more deadly than those of omission.

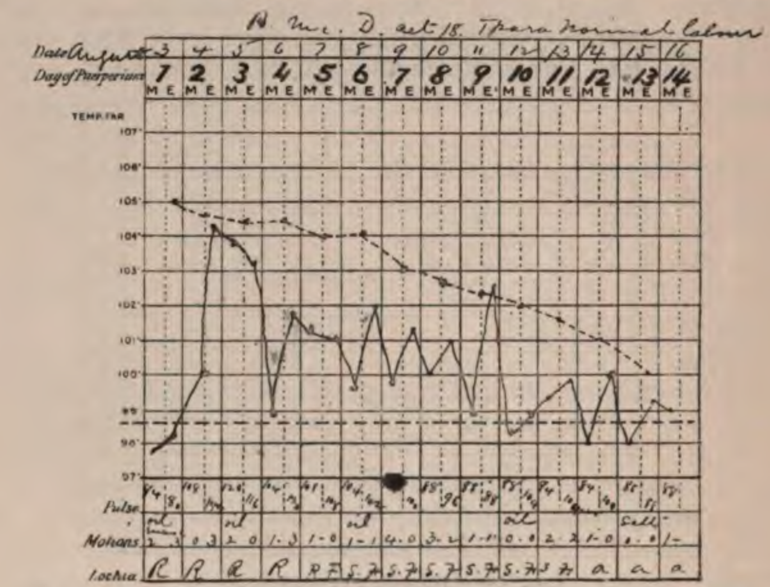


FIG. 19.—SLIGHTLY DELAYED INVOLUTION FROM SAPRÆMIC ABSORPTION.

The patient should be kept quiet, and allowed to see no visitors for several days. Among the working classes it is practically impossible to obtain this quiet, but fortunately excitement does not seem to affect them so much as it does better-class patients. The room should be well ventilated, and kept at a temperature of about 60° F. Stirring up of dust must be strictly avoided, so any dusting required should be done with a cloth damped with Sanitas or some other antiseptic.

The vulvar pads must be changed as often as they become soaked. For the first day or two this may be necessary every four or six hours. The vulva should be washed each time with an antiseptic lotion. The nurse or attendant should wash her hands each time, and soak them in the antiseptic, before touching the patient. Clean rags, or, better, swabs of gamgee tissue or absorbent wool, should be used for cleansing purposes and then burnt. The domestic sponge, so often used, is a frightful source of sepsis, and it should be strictly forbidden. The draw-sheet, binder, and nightdress should be changed when they become soiled. Some nurses have been trained to douche their patients once or twice daily, but, unless there is some special reason for it, this should be strictly forbidden, and, before delegating such an important operation to a nurse, satisfy yourself that she is properly equipped for it, and knows how it should be done. The binder should be tightened night and morning, and when this is being done the uterus should be gently massaged for a few minutes. This will assist involution and promote the expulsion of clots, if there should be any retained.

Within a few hours after delivery the patient should be encouraged to pass urine. To facilitate this the parts may be steamed or hot fomentations applied. Many patients are quite unable to micturate into a bed-pan when lying, but can do so with ease when allowed to rise on their hands and knees. When patients are strong enough to rise in this way to micturate, they should always do so, as it allows of free drainage of the vagina. If a patient is kept lying upon her back, and is only allowed to urinate and defæcate into a bed-pan which raises the pelvis, free drainage is impossible. Free drainage is of so much importance that in a few days the patient should be propped up in bed so as to ensure it. If the first effort to empty the bladder is unavailing, she may wait for a little, but within twelve hours after delivery she should try again, and if she fails a catheter must be passed. A trained nurse should be able to perform this delicate operation, but in many cases you must do it yourself. It must be done with strict aseptic precautions, and by sight, not by

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touch. You should make it a routine to inquire in every case on your first visit after delivery if urine has been passed. Unless the patient is suffering considerable inconvenience, she is not likely to volunteer the statement that she is unable to urinate. If the bladder is left overdistended for many hours, not only will there be great immediate suffering, but the after results may be very serious.

After-Pains.—Multiparous patients will almost invariably suffer from these for thirty-six to forty-eight hours after labour. If they are excessive, a dose of opium may be given. When they occur in primiparæ, they are, as a rule, due to retention of clot or a part of the secundines. In such cases it may be necessary to clear the uterus by means of the fingers and an intra-uterine douche.

Evacuation of the Bowels.—The bowels are generally sluggish, and must be cleared out forty-eight hours after labour. Any purgative may be used, but there is nothing better than the old-fashioned castor oil. A saline should be given if the milk is to be dispersed, but salts should never be administered after severe hæmorrhage. It may be necessary to give a simple enema of soap and water. During the remainder of the puerperium a daily evacuation should, if possible, be secured.

The Diet.—The patient will not be inclined for much food for a few days, but she will probably be thirsty. For the first three days she should be kept on fluids, such as tea and toast or biscuits, milk, gruel, milk puddings, soups, beef-tea, and porridge in the mornings, if she cares for it. After the bowels have been cleared something more substantial may be given, such as eggs, fish, rabbit, chicken, or a chop, and in a few days ordinary plain food. If she is nursing she must continue to take a good deal of farinaceous food and plenty of milk. If she is not nursing, the amount of fluid must be limited, but if she is thirsty she may be given a cream of tartar drink. In ordinary cases stimulants are not required.

Pulse and Temperature.—These should be taken morning and evening. As already stated, the pulse-rate should fall immediately after labour, and, if everything progresses favourably, it should remain somewhere about normal throughout the puerperium. The temperature is usually slightly raised during labour, but it should soon fall to normal, or a little below that, and remain about normal throughout. If the breasts become engorged it will rise slightly, but any rise of over 100·5° F. must be looked upon with grave suspicion. The pulse-rate is a much safer guide than the temperature. If it persistently remains high, even although the temperature does not correspond, there must be something wrong. In considering the complications of the puerperium we shall deal further with this.

The Breasts.—While involution is taking place in the various organs an entirely opposite process is going on in the breasts. This process of growth or evolution has begun during the pregnancy, and there has even been some secretion of milk. By the second or third day active secretion of milk will be established, and the breasts will probably be engorged and painful. As already stated, the temperature and pulse may rise a little.

Unless the woman is very delicate, or there is some very good reason for her not doing so, she should suckle her child. This is what Nature intends, and, as far as possible, Nature should be allowed to have her way. Suckling stimulates involution, and thus benefits the mother, while the child gets its natural nourishment. In our large cities especially, the number of women who can nurse their children seems to be much fewer than of old. This is not altogether from disinclination, but in many cases from actual inability.

During the last two or three weeks of pregnancy the nipples should have been drawn out, and occasionally bathed with a spirit lotion, so as to prepare them. They should be carefully washed before the child is allowed to suckle. Some advise putting the child to the breast immediately after labour, especially if there is any tendency to post-partum hæmorrhage, but it is better to wait for some hours, at least, until the woman has rested a little. The nipples must be kept perfectly clean, and, if there is the least tendency to their becoming tender or chapped, they must be treated at once. A preparation of tannic acid, sulphurous acid, and glycerine makes a good application. If the breasts become engorged and painful, a brisk saline purge will usually relieve them. They may also be carefully massaged by rubbing towards the nipples. Warm olive oil should be used on the hands while rubbing. Sometimes it will be necessary to exhaust them, or to relieve the pain by sedative lotions, such as lead and opium, or a belladonna preparation. If a lotion is used, care must be taken to thoroughly cleanse the nipples before the child sucks, or it may be poisoned. When the nipples are very flat, a nipple-shield may be necessary.

To disperse the milk, when nursing is not to be attempted, saline purges should be given and the amount of fluid diet restricted. Belladonna plasters or other preparations of the drug are frequently applied to the breasts, but the best means of checking the secretion is by having the breasts padded and firmly bandaged immediately after delivery. If this is done properly, the milk secretion will be checked in a very few days.

How long should a Puerperal Patient be confined to Bed?—No woman should be allowed to sit up, out of bed, until the fundus uteri has fallen below the brim. As this does not occur before the tenth day, she should not be allowed to rise before then. Working-class women, as a rule, rise far too soon, and, as a consequence, many of them suffer from subinvolution and displacements. If there is no trained nurse, then by the sixth or seventh day the patient may be lifted out of bed on to a couch while the bed is being thoroughly made, as ordinary attendants seldom know how to make a bed with a patient in it. This may be repeated each night, and will greatly add to the patient's comfort. By the end of a fortnight most patients will be able to be up for part of the day, and they may go about the house during the third week, and even go out for a little in fine summer weather. After a severe labour, if the parts have been lacerated, the patient should not be allowed to leave her bed until healing is complete.

Care of the Child.—This is largely left to the nurse, but the doctor should see that it is properly attended to. The eyes should be carefully washed, and if there has been any suspicious vaginal discharge from the mother, protargol (20 grains to the ounce) should at once be dropped into them. In hospital practice this, or some other preparation, is invariably used as a preventative of ophthalmia.

Dressing the Cord.—Before a dressing is applied, always examine the cord to see if there is any oozing. If there is, and in all cases where the cord is very thick, apply a second ligature about an inch from the skin. In a very short time a thick cord will shrink so much that the ligature will become quite loose, and bleeding of a very serious nature may occur. The cord is usually dressed with a clean linen rag, but it would be much safer to put a dry antiseptic dressing on it, after dusting it well with boracic acid. In hot climates this should always be done as a preventative of tetanus neonatorum. When the child is dressed it may be given a little sugar and water, but it should not be at once dosed with castor oil. It may be put to the breast in a few hours. On your first visit always ask if it has passed water and had its bowels moved. If the bowels have not moved, examine the anus to see if the rectum is occluded. The first milk or colostrum from the mother will usually move the bowels but, if it does not, and the rectum is patent, half a teaspoonful of castor oil may be given. If there is any difficulty with the urine, examine the foreskin in boys, as it sometimes requires to be dilated or incised. The administration of hot water or 10 drops sp. æth. nitrosi may be required to assist the kidneys.

The stump of the cord should drop off in from three to seven days, and you should then examine the umbilicus to see if it is all right.

The proper feeding of the child will be dealt with in a subsequent chapter.

CHAPTER XIV

THE HÆMORRHAGES OF THE EARLY MONTHS OF PREGNANCY

Menstruation — Purpura Hæmorrhagica — Scurvy—Hæmophilia—Hæmorrhage from a diseased Cervix—Hæmorrhage from Wounds of the External Genitals —Ectopic Pregnancy.

As a rule, when a woman becomes pregnant her monthly menstrual discharge ceases completely, and she should be free from any loss of blood from the uterus until labour occurs. In a few cases, however, menstruation is continued for the first two or three months. During this time the ovum does not entirely fill the uterine cavity, and until it does there is a free space between the deciduæ reflexa and vera from which the discharge may come. In other cases, again, menstruation has been noted as continuous throughout the whole pregnancy, and a very few rare cases have been recorded where women have menstruated only during pregnancy. An explanation of this phenomenon of menstruation during pregnancy is found, in some of the cases at least, in the fact that there is a double uterus. In the early stages of development the uterus is a double organ, and in rare cases fusion does not take place, so that a uterus didelphys persists, or the two halves may fuse, but the septum between them remains, giving a uterus bicornis duplex. The vagina may or may not be double. Each half has its own ovary and Fallopian tube, and an ovum may develop in one or both of the halves. If one side only becomes impregnated, the woman may continue to menstruate from the other side, but this does not necessarily follow, as is shown in the case of Mrs. W., p. 362. If the second should happen to become impregnated several months after the first, there would be a complete cessation of menstruation, and you would have a very interesting condition at labour of the birth of either a mature and a premature child at one time, or of two mature children within a few months of each other. This is an explanation of what is usually described as the condition of superfœtation.

Treatment.—Menstruation during pregnancy does not call for any special treatment, but the woman should rest at the times, as there is likely to be a tendency to an abortion or premature labour.

In rare cases slight irregular hæmorrhages may occur without any apparent cause, and they may continue throughout the whole pregnancy. The following is a case: Mrs. S. during her first pregnancy began to have a slight discharge of blood about the fourth month, and this continued until premature labour came on at the seventh month. There was no extra bleeding at the confinement, so it was not a case of placenta prævia. The child survived. During her second pregnancy she was under my care. About the fourth month the discharge commenced again, and it continued throughout the whole pregnancy. It was very slight, but it was nearly always present. Careful examination threw no light on the subject. Various drugs were given in addition to a continuous course of chlorate of potash, but nothing checked it. She went to full time, and was delivered of a fine healthy child. The placenta was normally situated, but it showed extreme fatty and calcareous degeneration. This was not a case of menstruation, neither was there a double uterus. The patient is healthy, and her ordinary menstrual periods are normal. The decidua was undoubtedly in an unhealthy condition, and the bleeding probably came from the part of it in the lower uterine segment. The chlorate of potash probably carried her on to full time. This patient has had a third child at full time. There was no bleeding during this pregnancy.

HÆMORRHAGES FROM BLOOD DISEASES.

Purpura Hæmorrhagica is an exceedingly rare complication of pregnancy, but when it does occur it is apt to interrupt the pregnancy. It may occur at any time during the pregnancy. A general hæmorrhagic rash appears all over the patient, and there is often bleeding from the kidneys, bowels, and stomach. The gums will also bleed profusely. The uterus is almost sure to expel its contents, and profuse hæmorrhage often occurs. The patient may die from hæmorrhage at the time of labour or abortion, or subsequently from exhaustion or sepsis. In some cases the disease may only manifest itself during the puerperium. In all cases the *prognosis* is exceedingly grave. For a fuller discussion of this condition, see Chapter V.

Scurvy.—This disease is occasionally found in pregnancy in large cities during times of distress. It arises from improper feeding, especially from the want of fresh meat and vegetables. A diet of tea and bread, with an occasional salt fish, is sure to be followed by scurvy sooner or later. It thus differs from purpura hæmorrhagica, as diet has nothing to do with causing the latter.

The disease will probably first manifest itself in the gums, which will become very spongy and bleed easily. Hæmorrhages will appear in different parts of the body. There may be a rash, but the hæmorrhages will usually be much larger, forming spots of ecchymosis. The disease differs in no way from an ordinary case of scurvy. In mild cases pregnancy may not be interfered with, but, if the disease is severe, abortion or premature labour may occur. The child may show evidence of the disease.

The prognosis is favourable in mild cases for both mother and child, but in severe cases it is unfavourable for both.

The treatment is the same as in ordinary scurvy—viz., a liberal fresh diet, with plenty of vegetables. Lime-juice may be given, and iron and arsenic. The mouth should be kept clean with an antiseptic wash.

Hæmophilia.—This is fortunately an exceedingly rare complication of pregnancy. If it should occur the patient would, as at other times, be liable to hæmorrhages in various parts of the body from slight injuries. She would likely be more liable to abort than an ordinary patient, and there would be great difficulty in controlling the hæmorrhage then and after labour.

The prognosis of labour or abortion in such a case would be grave.

Treatment.—I would suggest the administration of suprarenal extract for a few days before labour, or on the onset of abortion. To control post-partum bleeding the uterus and vagina should be very firmly plugged, preferably with strips of gauze steeped in a solution of suprarenal extract. If the ordinary gland substance were used, 30 grains of the powder should first be boiled for three minutes in a pint of water, so as to sterilize it. An intra-uterine douche of a couple of pints of this solution might first be given. The plug could be left in for twenty-four hours, and if there was any bleeding on its removal another should be inserted. The application of superheated steam (atmocausis) to the interior of the uterus has been strongly advocated by Pincus.

Hæmophilia is sometimes seen in the new-born infant. I reported a case of this in the *British Medical Journal* some years ago. The child died when about a fortnight old after repeated hæmorrhages into almost all parts of its body, including the joints.

Hæmorrhages may occur from various parts of the body, and also from the uterus, in severe constitutional diseases, such as hæmorrhagic small-pox, typhus and scarlet fever. The pregnancy will be almost sure to be interrupted.

The prognosis in such cases is exceedingly grave.

The treatment consists in the ordinary treatment of such diseases. Special attention must be paid to the prevention of post-partum hæmorrhage. In measles there is said to be a special tendency to post-partum hæmorrhage, but this has not been my experience.

Hæmorrhage from a Diseased Cervix.—In cancer of the cervix hæmorrhage may occur at any time during pregnancy. Coitus or the examining finger may cause it. There will probably be a foul discharge as well.

Diagnosis.—Per vaginam the cervix will be found to be ulcerated, and probably breaking down. It will bleed easily on touch. Care must be taken not to mistake it for a case of placenta prævia.

The prognosis is exceedingly grave as regards the mother.

Treatment.—In the early months the best treatment is complete extirpation of the uterus. If the case has gone on to full time, it may be possible to deliver a live child by the natural passages, but in many cases this will be impossible. In the interest of the child a Cæsarian section should be done, and a complete extirpation of the uterus. The woman's chances will be small, but, as otherwise her fate is sealed, you will be justified in taking great risks (see case, p. 515).

Hæmorrhage from Wounds of the External Genitals.—During pregnancy the external genitals become very vascular. The vagina takes on a dusky hue, and the veins about the vulva are frequently very varicose. An injury to the vulva or vagina may cause very violent hæmorrhage. If the surface is not broken, a hæmatoma will form, and it may reach a large size. If there is a wound it may be only a very small one, and yet the hæmorrhage may be most alarming.

A description of two such cases will suffice. In the first case, the woman, a multipara, was about seven months pregnant. While intoxicated she had fallen against the sharp edge of a tub into which she was micturating. She nearly bled to death from a small punctured wound in the vestibule, near the meatus urinarius. The wound was exactly like a leech bite. I had considerable difficulty in securing the bleeding-point with a ligature. The second case was also in a multipara about seven months pregnant. In getting out of bed hurriedly she had fallen astride of the back of a chair. The wound was a much larger one than in the other case, involving the meatus urinarius, and extending up into the vestibule. It was stitched with catgut before she was brought to us, and as it was still oozing we plugged the vagina and vulva, and put on pressure by means of a large vulvar pad secured with a T-bandage. Both cases did well, and went to full time.

The prognosis is good, if the patient is seen in time, but she may easily bleed to death if not attended to.

Treatment.—Secure the point by means of ligatures or stitches. You will find some difficulty in doing this, as there is so little tissue between the symphysis and the mucous membrane. If the meatus is involved you may have to tie a catheter in. In stitching be careful not to include the urethra.

In a case of hæmatoma apply cold compresses and use absorbents. If it is in the early months, it will probably absorb before labour. On the slightest indication of suppuration, incise, turn the clot out, and, after washing out the cavity, plug it thoroughly with iodoform gauze.

Injury to the vagina may be caused by violent coitus, or by something being pushed into it—*e.g.*, to induce abortion.

Treatment.—Secure the wound by stitches, if possible, or use a firm plug. We have found suprarenal extract very useful when there was much oozing of blood.

ECTOPIC PREGNANCY.

The subject of ectopic pregnancy is such a wide one that I shall not attempt to discuss it fully, but shall content myself with a short sketch of it from a clinical standpoint. As hæmorrhage is a very constant feature of this condition, it will be convenient to consider it in this section.

Under the term "ectopic" are included all the forms of pregnancy which occur outside the uterine cavity. At one time it was maintained that in all cases the primary starting-point was some part of the tube, but recently it has been shown that there is a primary ovarian form—*i.e.*, that the ovum becomes impregnated in the ovary, and attaches itself there from the very first. A primary abdominal form has not yet been clearly demonstrated.

When the ovum develops in that portion of the tube which penetrates the uterine wall, it is called an *interstitial pregnancy*. As it grows, it may push its way into the uterine cavity and give rise to a *tubo-uterine pregnancy*, which may go to full time, and terminate by delivery through the normal passages. The true *tubal varieties* are named, according to the position of attachment, *infundibular* or *ampullary*. The abdominal ostium of the tube is generally closed by adhesions before the eighth week, but in some cases the ovum grows out through it into the abdominal cavity, and gives rise to a *tubo-abdominal pregnancy*. The same condition may arise by the ovum forcing its way through the wall of the tube, or through the broad ligament secondarily to a primary rupture between its folds. If the ovum is extruded completely through the abdominal ostium and loses its attachments, so that further development ceases, a *tubal abortion* has occurred. When the fimbriæ become attached to the ovary and form a tubo-ovarian cyst, the gestation sac will grow into this and form a *tubo-ovarian pregnancy*. This form has frequently been mistaken for a true *ovarian* one. *Subperitoneo-pelvic* or *intraligamentous pregnancies* really begin as tubal, but either rupture through the lower part of the tube, or so stretch it as to extend between the folds of the broad ligament. If development continues, the peritoneum is gradually lifted up. If a secondary rupture occurs into the peritoneal cavity and development continues, you get a *tubo-abdominal* variety. In all cases where development continues after rupture the placenta must have remained fairly intact.

Course and Termination of an Ectopic Pregnancy.—Almost every variety may go to full time, but in most cases rupture occurs in the early months. In a considerable number of cases a tubal abortion occurs, by the ovum being extruded from the fimbriated extremity of the tube into the peritoneal cavity. When the impregnated ovum comes to rest in the tube, it becomes attached to a thickened portion of the mucous membrane, which forms a decidua serotina. The other deciduæ form, but not so completely as in a uterine pregnancy. The calibre of the tube is not very great, and in a short time the growing ovum will have distended it very much. The wall is very likely to give way, especially if any sudden strain be put upon it. A rough examination may very easily cause a rupture. There is a great tendency to hæmorrhages into the intervillous spaces, and this may cause rupture, or so affect the embryo as to destroy it. Rupture is liable to occur at the placental site, as the tube is thin there. If the tear is into the peritoneal cavity, the bleeding may be so profuse as to cause the patient's death in a very short time. If the pelvis becomes roofed over by adhesions, the bleeding may be checked by the pressure of the encapsuled blood, preventing fatal loss. A secondary rupture may occur and prove fatal. In many cases the tube ruptures at its lower part, and the bleeding occurs between the folds of the broad ligament. The pressure may prevent a very large quantity from being poured out. A secondary rupture may occur here into the peritoneal cavity and cause death. If the embryo has not been destroyed, nor the placenta interfered with, the ovum will go on developing between the layers of the broad ligament. The peritoneum will be gradually stripped up. The ovum is really growing behind the peritoneum, or in other words it is subperitoneal. If a secondary rupture does not occur, it may go on developing to full time. If the fœtus is not then removed by operation, it will soon die and shrivel up. It may be retained for many years without giving rise to much discomfort, but it is liable to contamination from the bowel, which lies so near it. It will then probably begin to discharge piecemeal through the rectum or elsewhere. When the embryo is destroyed in the early months it will very soon be absorbed, and many patients recover in this way by absorption of the ovum and clots. In some cases it may abort into the peritoneal cavity through the ostium of the tube without rupture occurring.

The placenta is said to grow after the death of the fœtus, but this is really not the case. It increases in size from extravasation of blood into its tissues. This extravasated blood becomes organized, and the placenta becomes changed into a mass of connective tissue. There is an increase in size, but it is not a true growth.

Twin embryos are occasionally found, and at times both tubes are affected, and occasionally a tubal pregnancy coexists with an ordinary uterine one. The corpus luteum has been observed to be in the ovary of the other side from that in which the pregnancy is, so that there must have been a migration of the ovum.

Changes in the Uterus.—The uterus enlarges to about the size of a third or fourth month's pregnancy, but does not increase beyond that, even if the fœtus develops to full time. A decidua forms in the uterus, and it is generally cast off about the time of rupture of the tube. The cervix is softened, just as in an ordinary pregnancy. When the ovum dies, the uterus gradually involutes and returns to normal size.

Signs and Symptoms.—In the early period you get the usual signs of pregnancy. Morning sickness is generally present, and the breasts may exhibit changes. As regards menstruation, it may be delayed or missed for a time, but irregular hæmorrhages usually occur after a few weeks. Shreds of the decidual membrane may be found in the discharge, or even a complete uterine cast. This is a most valuable indication, especially if a microscopic examination of it be made. Decidual cells and no chorionic villi will be found in it, thus distinguishing it from an early ordinary abortion. The patient may suffer from crampy pains. If an examination is made, the uterus will be found enlarged and the cervix softened. A careful bimanual examination will reveal a swelling at one or other side, apparently in the tube, and, unless it be an ovarian pregnancy, separate from the ovary. It is not often the condition is recognised before rupture. One seldom has an opportunity of examining a patient beforehand, unless the irregular hæmorrhages cause her to seek advice. In some cases the patient has no idea that she is pregnant, and if she is unmarried she may carefully conceal the fact that she might be in that condition. Prior to rupture, the indications are very obscure.

Symptoms of Rupture.—Rupture occurs usually before the twelfth week. Without any warning the patient may be seized with agonizing pain in the abdomen, followed by sudden collapse. There is a bloody flow from the uterus. The patient will show all the indications of profound shock and severe internal hæmorrhage. The small amount of external hæmorrhage cannot in any way account for the anæmia. If the rupture be only partial, the symptoms may not be very alarming, but, on the other hand, if it be complete and the hæmorrhage profuse, death may quickly follow. A secondary rupture may occur a few hours or days later, and, if the patient does not succumb to this, abdominal tenderness will show that peritonitis has set in. If the rupture has occurred into the broad ligament the hæmorrhage may be circumscribed, a hæmatoma being formed, and it can be detected by bimanual examination; but when the blood is free in the peritoneal cavity, you cannot detect it until it has gravitated into Douglas's pouch and become so far consolidated.

With the subperitoneal variety, if the vitality of the fœtus is not interfered with, it may go on developing. Secondary rupture may occur into the peritoneal cavity and cause the woman's death. In most cases the fœtus does not develop beyond the fourth month, but it occasionally goes on to full time.

When a tubal abortion occurs the symptoms may not be very severe, and the condition may easily be mistaken for some other form of tubal disease. There will probably be repeated hæmorrhages, and a hæmatocele will form and be gradually absorbed, or it may suppurate.

Antecedent pelvic disease will generally have been present. The condition is much more common with multiparæ than with primiparæ, and it not unfrequently follows a time of sterility. It may recur.

Diagnosis.—Before rupture this is not often made, as patients are seldom examined, but a careful bimanual examination would reveal an elastic swelling in the tube by the side of a slightly enlarged and somewhat softened uterus. Distinct pulsation may be detected in the mass, and, if the ovary as well can be felt separate from the mass, you can be sure of your diagnosis. In the only case which I have seen before rupture, the mass could be made out, quite distinct from the ovary. In examining a case of this kind it must be done gently, as any rough handling may easily cause a rupture. At the time of rupture into the peritoneal cavity, the severe localized pain and collapse of the patient, and the vaginal hæmorrhage, will point to what has occurred. A bimanual examination will reveal a mass at one or other side of the uterus, but this may not be very distinct at first. If the hæmorrhage is into the broad ligament, the mass will be more easily detected. In all cases where a membranous cast comes away, it should be submitted to a microscopic examination for decidual cells. In doubtful cases a scraping may be taken from the interior of the uterus for microscopic examination, but this must be done with great care.

In the later months you have the usual signs and symptoms of pregnancy. The fœtal parts can generally be felt very distinctly, but with a very thin abdominal and uterine wall they may be felt in a normal pregnancy with equal ease. The tumour will probably not be in the middle line, and you may be able to make out the body of the uterus distinct from it, but one must be careful not to confound a double uterus with the condition. It must also be borne in mind that a normal pregnancy may exist with an ectopic one.

At full time labour will come on, and, beyond a decidual cast, nothing will be expelled from the uterus. The pains will pass off, and the fœtus perish. The placental circulation will gradually cease after the death of the fœtus. The abdomen usually decreases in size, and the breasts become flaccid. The fœtus may form into a lithopædion, and lie quiescent for years, or it may become infected from the bowel, and septic symptoms appear. If the patient does not die, the fœtus may be discharged piecemeal through the abdominal wall, bladder, vagina, or rectum.

Prognosis.—The condition is a very serious one, but, if the patient be seen in time, and the case be suitable for operation, prompt action will probably save her.

Treatment.—Before rupture, operate as soon as possible, for you never know how soon rupture may occur. The operation may be done through the vagina, but the abdominal route is preferable. The tube should be ligatured and removed in the usual way. Care must be taken not to rupture it.

After rupture, if hæmorrhage is still going on, operate at once to check the bleeding. Open the abdomen, and at once clamp the bleeding tube, and tie and remove it. Then clean the clot out. If there is much collapse, a quantity of saline solution may be left in the peritoneal cavity. The patient should be freely stimulated, and given a large saline infusion. If the hæmorrhage has ceased, but the patient is so collapsed that the shock of an operation would kill her, she should be freely stimulated, and have a large saline infusion, to rally her before operating.

In cases first seen some time after rupture, where a hæmatocele has formed, there is no doubt that many may recover without operation; but the convalescence will usually be tedious, and there is always the risk of suppuration occurring, so it is generally preferable to operate. In these cases incision through the vagina may be practised.

In advanced cases the great difficulty lies in dealing with the placenta when the child is alive. If the placenta is so situated that it can be peeled off without risk of the patient bleeding to death, it should be removed, and the hæmorrhage controlled by packing the sac with gauze, but if the placenta is in such a position that it cannot be removed, the cord should be ligatured and cut off close, and the sac packed with gauze. The sac is then stitched to the edges of the incision, and the end of the gauze packing left protruding at the lower end of the wound. After some days the mass may be removed, but there is considerable risk of secondary hæmorrhage, and, if septic infection occurs, the outlook is bad. The packing must be renewed as often as required.

If a spurious labour has occurred and the fœtus is dead, a few weeks should be allowed to elapse, so that the circulation in the placenta may cease. The fœtus and placenta should then be removed, and the sac plugged and treated in the usual way, until it closes from the bottom.

CHAPTER XV

THE HÆMORRHAGES OF PREGNANCY—*Continued*

Abortion—Frequency—Time of Occurrence—Causes—Conditions in the Uterus in the Early Months of Pregnancy—Varieties of Abortion—Signs and Symptoms — Diagnosis — Treatment — Curetting — Procured Abortion — Criminal Abortion—Spurious Abortion—Prophylactic Treatment of Abortions—Vesicular Mole.

ABORTION.

THE commonest cause of hæmorrhage in the early months of pregnancy is an abortion. The terms "abortion" and "miscarriage" are applied to the expulsion of the uterine contents before the fœtus has reached a viable age—*i.e.*, before the seventh month; from the seventh month onwards it is known as a premature labour. Strictly speaking, it is an abortion until the placenta is fully formed—*i.e.*, until the end of the third month; from that time onwards until the seventh month it is a miscarriage. To the lay mind the word "abortion" is usually associated with criminal practices, so it is well to avoid using it to patients. The terms in common use are "miscarriage" and "mishap."

Patients are very apt to treat abortions, especially those of the early weeks of pregnancy, as things of very slight importance. Nay, more, many women have not the slightest hesitation in deliberately attempting to bring on an abortion in the early weeks by overexertion, strong purgation, and the use of quack nostrums which are openly advertised in the public prints. Many drugs are used for this purpose—*e.g.*, ergot, savine, pennyroyal, etc. There is one—viz., lead —which seems to be extensively used in some parts of England, but not, so far as I am aware, to any extent in Scotland. Pills, made up of common diachylon plaster, are the form in which the lead is taken. The results are usually unfortunate to the woman as well as to the pregnancy. Not only will she abort, but lead-poisoning will supervene if the drug has been taken for any length of time, and if she escapes with her life it will probably be with a ruined constitution. In dealing with cases of lead-poisoning among women it is well to keep this source of the poison in mind, especially if there is any question of an abortion in the case. Of course, the lead may have been quite innocently conveyed into the system, but, in that case, one ought to be able to find the source of it.

We cannot too strongly impress upon our patients that an abortion, when it does occur, is not a thing to be neglected, and that they should never attempt to bring one on. There are, of course, cases in which one is justified in emptying the uterus, but of these I shall treat later.

The immediate dangers from an abortion are comparatively slight, but the remote consequences may be very serious if the condition is not properly treated. If all cases were properly treated, gynæcological work would be materially lessened. In a very large percentage of cases of pelvic disease the patients themselves will tell you that the trouble began after an abortion.

Frequency of Occurrence.—Thirty-seven per cent. of child-bearing women are said to abort at least once before the age of thirty-one, and from that time onwards abortions are much more common. Some authorities assert that one-fifth of all pregnancies are interrupted before full time. Primiparæ are not so liable to their occurrence as multiparæ. Very few child-bearing women escape without having at least one abortion.

Time of Occurrence.—It usually corresponds with the time a menstrual period would have occurred had the woman not been pregnant. When pregnancy does not exist, we know how the uterus becomes hyperæmic at each menstrual period, and this tendency continues during pregnancy, so one can easily understand why an abortion is apt to occur at these times, especially during the early months, before the placenta has been fully formed and the deciduæ become atrophied. The third month is probably the one at which most occur.

We do not know where the spermatozoa fertilize the ova, nor how long a time may elapse from insemination until this occurs. The frequency of tubal pregnancies, of course, proves that, in a fair number of cases, the meeting-point is probably the tube, but from this it does not follow that the tube is the usual place. Neither does the fact of an ovarian pregnancy prove that the spermatozoa always impregnate the ova before they are shed from the ovary. How long the spermatozoa retain their activity is not known, but in animals, at all events, they have been found quite active after several days. It is probable that some hours may elapse before the junction between the two occurs. If insemination has taken place immediately before menstruation is due, there may not be time for the changes to take place to stop the period, and prepare the uterine mucosa for reception of the ovum, and the fertilized ovum may very easily be swept out with the menstrual flux. The term *menstrual abortion* has been applied to this. That it does not always occur is, of course, proved by the fact that, in a number of cases, menstruation goes on for a time or two after impregnation. In these cases impregnation may have occurred some time before the period was due, and the ovum may have been so firmly attached that it was not dislodged. From a practical point of view the condition is of very little importance, as the woman is not likely to suffer any inconvenience from it.

Causes.—These may be taken up under four headings—viz., fœtal, maternal, paternal, and accidental.

I. *Fœtal.*—(1) Diseases of the chorion, amnion, placenta, or cord; (2) sudden loss of liquor amnii, which may be caused by an accident, or intentionally by the passage of an instrument; (3) anything which causes the death of the ovum; (4) implantation of the placenta in the lower uterine segment. These cases give rise to unavoidable hæmorrhage if they go to the sixth month or later.

II. *Maternal.*—(1) Syphilis. This is the commonest cause of all among a certain class. It is apt to cause repeated abortions. (2) Diseases of the uterus, especially endometritis which affects the deciduæ. (3) Displacement of the uterus. (4) Tumours of the uterus or other pelvic organs. (5) Serious constitutional disease of any of the systems of the body. (6) Febrile conditions from any of the specific fevers. (7) Poisons, such as phosphorus, arsenic, or lead. Some women are said to contract the habit of aborting, but a more feasible explanation of such cases is that there is chronic disease of the uterus, probably endometritis. I have seen a case where eighteen abortions had occurred consecutively.

III. *Paternal.*—(1) The commonest cause on the part of the father is undoubtedly syphilis, and as the ovum is syphilitic, it becomes a fœtal cause. The mother may become affected, so the disease may act on the uterus as well as on the ovum. (2) Extreme youth or age of the father is also a cause.

IV. *Accidental.*—(1) Physical. Direct violence from a blow, fall, or injury of any kind. In some cases a very slight accident may cause it, while in others the woman may be very severely injured—

e.g., by kicks on the abdomen, or severe crushing, and yet the pregnancy not be interfered with. Indirect violence from overexertion—*e.g.*, from riding on horseback, on a cycle, in a cab or railway train, dancing, playing tennis, etc., and among the working classes from overwork, such as lifting heavy weights, or overstretching in hanging up clothes, etc. A very severe fit of coughing, sneezing, or vomiting may also cause it. Excesses in eating, drinking, or coitus are also given as causes. (2) Mental. Any mental shock, such as the sight of an accident, sudden bad news, etc., or violent indulgence of the passions, may act as an indirect cause through the nervous system. The shock of a serious operation may cause it. Of late years abdominal operations during pregnancy have become fairly common. In some, abortions have occurred, but in many cases the pregnancy has gone on to full time.

Conditions in the Uterus in the Early Months of Pregnancy.—Before considering the symptoms, etc., let us look at the conditions we have in the uterus in the early months. At conception the uterine mucous membrane becomes thickened, forming the decidua vera; at the point where the ovum becomes implanted this thickening is specially marked, forming the decidua serotina where the placenta is to form; and, growing up round the ovum, we have the decidua reflexa. As the ovum grows, the decidua reflexa gets pushed out against the decidua vera, and they blend and become thinned out, so that at the end of pregnancy they form a very thin layer over the chorion. To completely empty the uterus, all within the spongy layer of the deciduæ vera and serotina must come away. Before the placenta is formed, the deciduæ vera, reflexa, and serotina, with the enclosed ovum in its membranes, must come away. It is important to remember this, because you will occasionally find the ovum expelled and nothing else, or the ovum and decidua reflexa, leaving the deciduæ vera and serotina behind. A recent case of mine illustrated this beautifully. The patient assured me that everything had come away. Fortunately, everything had been kept, and I found a complete ovum about two months old. The sac was intact, and covered all over with villi. The entire decidual lining was still within the uterus. If I had not seen the ovum I might easily have been misled, because a vaginal examination revealed nothing, as the os was closed, and nothing could be felt except that the uterus was large. I at once gave chloroform, and cleared the deciduæ out. Nature might possibly have expelled this without any bad effects, but, on the other hand, the result might have been very serious. An examination of an early complete abortion will at once convince you that the ovum itself is only a small part of what has to be removed in order to thoroughly clear out the uterus. When the placenta is fully formed the deciduæ are thinned out. Then the placenta and membranes are the most important part of the abortion. An abortion is not the expulsion of the ovum in the early months, but the expulsion of the uterine contents. This must be clearly borne in mind, otherwise the most important part of the uterine contents may be left behind.

During the first two months especially the deciduæ are very vascular, and, therefore, liable to hæmorrhage. The hæmorrhage may be behind or into the deciduæ, between the reflexa and the ovum, or into the ovum itself. When blood is once poured out, it acts as a foreign body, and causes uterine contractions, which will cause more separation and more bleeding. After the placenta has formed, the hæmorrhage will arise from separation of some part of it. You can easily understand how any disease of the endometrium will predispose to an abortion, as hæmorrhage is more apt to occur. As a rule, conception does not occur if there is much endometritis, but in slight cases, and those which are partially cured, it may. Such a case is almost sure to abort. A number have come under my observation in dispensary work. Coitus should be strictly forbidden in cases of endometritis under treatment, but, unfortunately, one's instructions are not always carried out.

Varieties of Abortions.—Abortions are usually divided into two main divisions—threatened and inevitable. The latter may again be subdivided into complete, incomplete, and missed. Procured abortion, which is often criminal, is another variety. We shall deal with it separately.

Signs and Symptoms.—There may be a few premonitory symptoms, such as a feeling of faintness and vomiting, but these are of little consequence. If it is a very early abortion, the patient may think it is merely a prolonged and profuse menstrual period which has been delayed for a few days.

Pain and **hæmorrhage** are the cardinal indications. The pain may be felt some little time before the hæmorrhage becomes apparent, but the hæmorrhage may appear first. The pain is felt in the pelvis, and is usually intermittent in character, very like early labour pains or the pains of dysmenorrhœa. In a short time you have the hæmorrhage and pain together. The hæmorrhage may be intermittent, recurring at intervals of several hours, or even days, or it may become continuous like a menstrual flow. There may be clots expelled, or in some cases only a free serous flow at first, the clots being retained *in utero*. As a rule, the bleeding is not alarmingly profuse, but it may continue for a long time and weaken the patient markedly (see cases, pp. 164, 166, 167 and 168). The pain in some cases is not very severe, while in others the woman will complain that it is as bad as, or worse than, with a full-time labour.

As soon as the uterus is thoroughly emptied the pain will cease, and the hæmorrhage also; but there will still be some lochial discharge, as after a full-time labour, but not as profuse or prolonged.

Threatened Abortion.—The pains are slight and irregular, with a considerable time between them. The hæmorrhage will not be great, and on examination the os will be found closed, or only very slightly dilated. As a rule, the bleeding does not continue very long, but it occasionally does so. I have recently delivered at full time a patient who had a threatened abortion in the early weeks of pregnancy. In spite of complete rest in bed, and appropriate treatment, the bleeding went on almost continuously for nearly two months. Nothing ever came except blood, but I was not absolutely sure that it was not a case of incomplete abortion until we made an examination under chloroform. We decided that the ovum was still intact in the uterus, but, of course, were unable to say whether or not it was alive. This was at the end of the third month. No more bleeding occurred, and in due time she quickened and went to full time The placenta was normally situated, and appeared perfectly healthy. The child weighed 9¼ pounds, so it had not apparently suffered in any way.

The ovum may perish and be retained *in utero* for a varying time, causing a missed abortion.

Inevitable Abortion.—The pains are stronger and more regular, the bleeding much more profuse, and on examination the os will usually be found to be dilating. The ovum will often be felt beginning to protrude. The pains will become stronger and at shorter intervals, until the uterine contents are expelled, in part or entire. If a part only is expelled, it will be an incomplete abortion; but if the whole comes away, it will be a complete one.

Incomplete Abortion.—In an incomplete abortion in the early stage of pregnancy, the ovum alone may come away, leaving the deciduæ behind; or the decidua reflexa may come with it, leaving the vera and the serotina behind. After the placenta has formed, it and the membranes may be retained in whole or in part. The portion left behind may come away entire or in pieces, and until it is all away there will be considerable discharge. If sepsis occurs, the woman will run considerable risk at the time, and she will be almost sure to suffer from subsequent inflammatory disease of the Fallopian tubes, ovaries, pelvic connective tissue, or endometrium. Sometimes a small piece of placenta remains firmly attached, and forms a so-called placental polypus, which consists of a mass of connective tissue formed from an organized blood-clot in and around the bit of placenta. Compressed and degenerated chorionic villi can be detected in it with the microscope. Hæmorrhages will occur so long as this remains *in utero*.

Missed Abortion.—In some cases the ovum perishes, but is not expelled at once. It may be retained *in utero* for months. I have seen one which was retained for five months. In a somewhat recent and famous case, a portion of a blighted ovum was said to have been retained sixteen months. At the time the ovum perishes you will probably have an abortion threatened, but this passes off without the uterus expelling its contents. The symptoms of pregnancy disappear except the amenorrhœa. The uterus does not increase in size as a rule, except in cases of fleshy moles, into which fresh hæmorrhages occur. The increase in size will not correspond at all with the supposed time of pregnancy. The uterine contents will ultimately be expelled, with the symptoms of an abortion. The ovum may be shrivelled up or in the form of a fleshy mole. A shrivelled or blighted ovum is not infrequently expelled at full time along with a fully-developed child. I have seen six or eight such cases.

If you examine a good specimen of a fleshy mole you will find it is somewhat rough on the outside, and, on opening it, a small cavity will be seen lined with a smooth, glistening membrane. This is the remains of the amniotic cavity. You may sometimes find traces of the embryo, but, as a rule, it will have been completely absorbed. Under the microscope the mass will be found to consist of organized blood-clot, with degenerated chorionic villi in it.

Diagnosis of Abortion.—The first thing we have to satisfy ourselves about is that the woman is really pregnant, and, if so, that it is an ordinary, and not an extra-uterine, pregnancy. Having determined this point, the next thing to decide is whether it is a threatened or an inevitable abortion, because our line of treatment in the former will be, if possible, to prevent, while in the inevitable it will be to hasten, the emptying of the uterus.

If the bleeding is small in amount, the pains not very strong or frequent, and the os closed or only slightly opened, we may look upon it as merely threatened. On the other hand, if the pains are strong and regular, the bleeding copious, and the os dilated so that the ovum can be felt protruding, we may be sure it is inevitable.

In very many cases we only see the patient after a mass has been expelled, and we now have to decide whether it is complete or incomplete. If the mass has not been destroyed, by examining it carefully we may be able to decide that the uterus is completely emptied. If you get a complete specimen, there will be no difficulty, but unfortunately you do not often see what has come away. You will then have to judge by making an examination. If the finger can be passed into the uterine cavity, you will be able to feel if there is anything retained, but without chloroform this is not often practicable. If the bleeding and pains have ceased on the expulsion of the mass, the chances are that the uterus is empty; but if the discharge of blood is still going on freely, or if it recurs in a day or two, there is sure to be something retained.

In an incomplete abortion the discharge usually continues, and if it has stopped it recurs at intervals. If you are fortunate enough to see what has been expelled, you will find it is only a portion of the product of conception. In the first two months it may only be the ovum, or the ovum and decidua reflexa. From the third month it may be the small fœtus, or it and the membranes alone. The entire placenta and membranes may be left behind, or the placenta alone, or portions of each.

An examination without chloroform may reveal that there is something still in the uterus, but it is much better to give chloroform, and then you can treat it at once, as I shall shortly indicate.

The following three cases of incomplete abortion may be taken as types. In the first I was called to see a woman, whose own medical attendant was engaged. She was supposed to have had a complete abortion a few days before. The bleeding had recurred, but it had ceased when I saw her. A vaginal examination revealed nothing, as the os was closed, but I felt sure there was still something retained *in utero*. I examined her under chloroform, and removed with a flushing curette a piece of placenta about the size of a large bean There was no more hæmorrhage, and she made an excellent recovery. The second case had been under treatment for a month with recurring hæmorrhages. She had been assured that the abortion had all come away. I was hurriedly called one night to see her, as she was bleeding very profusely. I removed a complete placenta from the uterus.

It was very septic. She made a good recovery. That she did not die of sepsis was a marvel. In the third case, when I first saw her, the hæmorrhage was only slight, and I tried to prevent the abortion, but in a few hours the ovum was expelled, but the whole of the deciduæ were left behind. An examination revealed that they were beginning to separate. As there was no hæmorrhage, I waited a few hours before using the curette, and the complete cast was expelled.

Missed Abortion.—The diagnosis may be very difficult. The signs and symptoms of pregnancy will have disappeared, except the amenorrhœa. If you have a history of pregnancy with a supposed abortion some time before, followed by amenorrhœa, and if you find that the uterus is not nearly the size it should be, you should suspect it is a missed abortion, but you must always bear in mind that it is possible that the patient may have had a complete abortion and have become pregnant a second time before menstruating. If you have any doubt, wait for a few weeks, and, if it is a normal pregnancy, the increase in the size of the uterus will be steady, but if there is no increase you can definitely decide that it is a missed abortion. You must, however, bear in mind that with a fleshy mole you may have an increase in the size of the uterus from repeated hæmorrhages into the mass. In such a case the difficulty of making an absolute diagnosis would be very great. To make sure, you could dilate the cervix and explore the uterus and treat it, as I shall shortly indicate, but if you were in great doubt, it would be better to wait and see if the woman quickened, provided, of course, that she remained in good health. If she did not quicken, or if her health began to suffer, dilatation should be done. The case related on p. 159 illustrates the wisdom of waiting. There were strong indications there that the ovum might have perished, and if I had been hasty in acting I would have interfered with an ovum which ultimately developed into a fine healthy boy.

Treatment of a Threatened Abortion.—The patient must be kept quiet in bed. If the bowels are loaded, they should be cleared out with a gentle laxative, or, better, by means of an enema of soap and water. A drastic purgative must be avoided. The food must be light and non-stimulating. The medicinal treatment aims at quieting uterine action. Opium in one form or other is, I think, the best drug. Viburnum prunifolium extract is highly spoken of as a uterine sedative. I have used it with good results. Hydrastis canadensis is also said to be useful, but I have had no experience of it. Small doses of ergot are also highly recommended by some, but condemned by others. My experience of ergot is that it is very uncertain in its action. This is probably due to the fact that the preparations used are often not freshly made. On the whole, I am inclined to think opium is the best drug to use.

The patient must be kept quiet in bed for a week or ten days. If there is any displacement of the uterus, it should be rectified and kept in position by a pessary. You must warn the patient to be specially careful when her next period or two are due. She should rest then. If you find there is a syphilitic taint, put her on mercury and iodide of potash, and keep her on it until full time. In cases where abortions not due to syphilis have been frequent, I have got very good results from chlorate of potash (10 grains) thrice daily all through the pregnancy. The use of this drug has been condemned, but I have seen such good results from it that I have confidence in recommending it, especially in cases which miscarry about the fourth or fifth month. I have a patient who has repeatedly miscarried when not getting the drug, and in three of her pregnancies has gone to full time while taking it. I might refer to others. A therapeutic journal took me severely to task for recommending a drug which is said to have a deleterious effect on the red blood-corpuscles when persistently taken for months. That may be true in theory, but, in my experience, it is quite erroneous in practice.

Treatment of Inevitable Abortion.—In spite of your treatment, some cases, which appear to be only threatened, will become inevitable. Your line of treatment must then be changed. In an inevitable abortion, you must try to get the uterus emptied as soon as possible. There are several methods in use. It was, and still is, a very common practice to give ergot in full doses, in the hope that the uterus will expel its contents. As this is a very uncertain method, and often ends in an incomplete abortion, it is not to be trusted to.

In a case where the discharge is free, and the os not sufficiently dilated to admit of clearing out the uterus, your best plan is to plug the vagina thoroughly after douching it out. Iodoform gauze makes the best plug, but aseptic lint or a kite-tailed plug of pledgets of aseptic wool answer the purpose equally well. Full doses of ergot may be given. The plug should be removed within twelve hours. On its removal the ovum will often be found lying on the top of the plug. If the os is not sufficiently dilated to clear out the uterus with your finger or curette, you may plug once again. Plugging should not be repeated too often, as the pressure of the plug upon the mucous membrane of the vagina will cause irritation, and even destruction, of the superficial layers.

In a case where the os is dilated sufficiently, remove the uterine contents with your finger. You may be able to express it bimanually. Ovum forceps may be used, but your finger is the best instrument. If you cannot get it all away, use the curette. Always assure yourself by digital examination that the cavity is cleared. It is impossible to tell this with the curette, and you may easily leave a portion behind. Douche out the uterus with an antiseptic. The hæmorrhage usually ceases on douching, but in rare cases it continues. The uterine cavity should then be plugged with an antiseptic or aseptic plug. Iodoform gauze makes the best antiseptic plug. The plug should be removed within twelve hours. After clearing out the uterus, ergot should be given for a day or two.

In some cases it may be desirable to clear the uterus at once. Dilatation can be effected by means of dilators, such as Hegar's—the metal ones are the best. Tents are advised, but it is very difficult to make sure that tents are aseptic, and, if not, the risk is very great. For that reason they should not be used. When the os is sufficiently dilated the uterus should be thoroughly cleared out, by means of the finger, and, if necessary, the curette.

Complete Abortion.—The treatment is the same as after a full-time labour—viz., to thoroughly cleanse the patient at the time, and keep her clean during the puerperium. She should keep her bed for at least a week.

Incomplete Abortion.—Ergot is often given in the hope that the retained portion will be expelled, but this is bad treatment. The following case of my own will illustrate this: When I saw the patient, late at night, I found a small fœtus had been expelled. I could find nothing else. An examination revealed that the os was closed, and nothing could be felt. The discharge was very slight. The question was, Was the placenta still *in utero*, or had it been expelled? As there were no membranes with the fœtus, one would have expected to have found a portion of them protruding, but none could be felt. The proper proceeding would have been to have given chloroform and made sure, but as I was not prepared to do this, I unwisely decided to give her ergot and wait. The result was that when expulsion commenced there was severe hæmorrhage, and I had to clear out the uterus under chloroform, when the patient was almost pulseless. She made a good recovery, and, I believe, considers that I saved her life, but I, on the other hand, am convinced that my failure to do what I ought to have done when I first saw her, very nearly ended in disaster. I have already cited another case (p. 161) where failure to clear out the uterus nearly cost the woman her life. In a third case I was asked to remove a placenta which had been left in the uterus for over three days after a miscarriage at the fourth month. There had not been any hæmorrhage, but the patient had become septic. The placenta was very firmly adherent, and I had great difficulty in getting it away, as the os had contracted and the cervix was extremely rigid. The patient made an excellent recovery, but her septic condition might very easily have been increased by absorption through the freshly-opened sinuses. The risk of this occurring is exceedingly great.

The proper treatment is to clear the uterus completely This may be done with a curette or the fingers. If the curette is used, the cavity should be explored with the finger to make sure that everything is removed. With the patient in the lithotomy position and under chloroform, carefully cleanse the external parts and wash out the vagina, scrubbing its walls with swabs of cotton. Lysol solution (1 per cent.) is one of the best to use. Then draw back the perineum with a speculum, and catch the cervix with volsella forceps to draw it down and steady it. If the finger can be passed into the cavity, dilatation is sufficient, but if not, dilate by means of graduated metal dilators. Before removing anything, wash out the uterus with your antiseptic solution by means of a double-channelled nozzle. Then separate the retained portion and remove it. The finger is the best instrument to use, especially in septic cases, as you can feel what you are doing. If you are quite satisfied that everything has been removed it will not be necessary to use the curette, but in many cases there will be small portions which can only be scraped away with that instrument. A flushing instrument which is not too sharp is generally used, but I prefer using the instrument shown in Fig. 20.

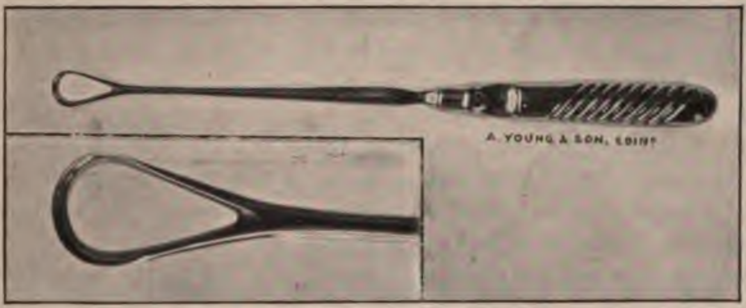

FIG. 20.—AUTHOR'S CURETTE FOR ABORTIONS.

It is a broad instrument with a fairly sharp cutting edge, and it will clear the deciduæ away without much force having to be used. I have found the dull curettes useless instruments in the very cases in which curetting is necessary—viz., where the deciduæ are adherent. After the uterus is cleared, douche it out very thoroughly with lysol, and put a loose plug of iodoform gauze in the vagina. The bleeding usually ceases with the douching, but it occasionally persists. The best method of checking the hæmorrhage is by plugging the uterine cavity and vagina with iodoform gauze.

The after-treatment is the same as after an ordinary abortion. Douching is unnecessary unless sepsis develops, when the uterus must be carefully washed out.

In septic, incomplete abortions, the uterus must, if possible, be carefully cleared out by means of the fingers, but before doing so it should be thoroughly douched with lysol to wash away as much as you can of the septic material. When the contents have been removed, and the uterine cavity well washed out, a thorough swabbing with tincture of iodine (the old Edinburgh tincture preferably) is advisable, or you may plug with iodoform gauze. If the temperature keeps up, daily washing out of the uterus will be necessary. In most cases the septic condition is really a sapræmic one, and the removal of the stinking mass will be quickly followed by a fall in the temperature, but if it is due to septicæmia there will be a rise in temperature from absorption through the freshly-denuded surfaces. In such a case the after-treatment will be the same as in a case of septicæmia after a full-time labour, to be described later on.

Cases of Abortion with Excessive Hæmorrhage.—I have stated that, as a rule, there is not much risk from hæmorrhage, but there are exceptions to this rule, as the following three cases and the one on p. 164 show :

CASE I.—Early one morning I was called to a multipara, an old patient of mine, who had removed a short distance out of town. The telephone message was to the effect that she was in labour. When I reached her, I found she was nearly pulseless through hæmorrhage from an incomplete abortion at the third month. The os would admit a finger, and I could feel there was still a mass of decidual tissue in the uterus. She was a stout woman, and it was quite impossible to empty the uterus without giving an anæsthetic. As I was unable to get assistance at the time I plugged firmly, stimulated her freely, and gave her a saline injection by the rectum. Three hours later Dr. Carstairs Douglas gave her chloroform after we had given her a saline infusion of 2 pints, and I quickly cleared the uterus with my fingers. There was no more bleeding, and she made a good recovery, but was very anæmic for some time.

Case II.—Mrs. P., aged twenty-three, 3-para. On p. 412 the record of this patient's second labour will be found. She then suffered from inversion of the uterus. After her recovery menstruation occurred fairly regularly for several months, and she then began to bleed continuously for two months. There was no amenorrhœa antecedent to this prolonged bleeding.

The patient now came to see her medical attendant, Dr. Christie. She asserted that there was no possibility of pregnancy. Dr. Christie found that the uterus was enlarged, and he thought there was a tumour, but the vagina was so tender that it was impossible to make out anything definitely. He asked me to examine her under chloroform on the following day to decide what operation, if any, would be necessary.

I found the uterus was enlarged to almost the size of a three months' pregnancy. The os was slightly dilated, and there was a large amount of soft material in the uterine cavity. The patient began to bleed very profusely. As I had not expected to do any operation, I had only one small curette with me. With it I cleared out about two handfuls of decidual-like material. There was still a considerable amount in the uterus, and as the bleeding had been severe I determined to plug the uterine cavity very firmly and clear the remainder out next day. The patient was very weak, and at the time was suffering from an influenza cold.

The material removed was examined at the West of Scotland Research Laboratory, and Dr. Leslie Buchanan reported that there were many normal decidual cells in it, but no indication of deciduoma malignum.

Next day I removed the plugging and washed out the uterus. There had been some hæmorrhage, but there was none after the removal of the plug. As the patient was very weak, I did not attempt to curette the uterus. On the following day I found a somewhat elongated mass beginning to protrude from the cervix. I removed this, and found it was undoubtedly a piece of placenta. I then curetted the uterus thoroughly, and washed it out.

The patient's temperature had now risen, and her breathing become embarrassed. Dulness was detected at the base of the lungs. She passed through a very sharp attack of double pneumonia, but ultimately recovered. After the uterus was thoroughly cleared out the discharge of blood ceased.

The husband asserted that he had never had connection with his wife since her previous confinement, and that she could not be pregnant, but there is no doubt that she was. It certainly was not a case of retention of a bit of placenta from the previous confinement. As the uterus was then inverted, I saw the interior of it, and cleared it of all bits of placenta and membrane.

The origin of the pneumonia was an attack of influenza. The uterine discharge was offensive for one day, but fortunately no uterine complication arose, or there would have been very little chance for the patient. At one time the case seemed a very hopeless one. I regretted very much that I had not been prepared to thoroughly clear out the uterus at the one sitting.

Case III.—This patient, aged thirty-nine, was seen by me in consultation with Dr. Wilson, Irvine, in July, 1903. About last October Dr. Wilson had been called to treat her for hæmorrhage. He removed from her vagina a small placenta. There was no trace of a fœtus seen, but the pregnancy had evidently reached the end of the third month. The hæmorrhage had then ceased. In the end of February of this year she again became pregnant, and suffered from morning sickness. In April she again aborted, and Dr. Wilson removed a decidual mass. Menstruation had not been re-established after this, but, about a fortnight before I saw her, she had begun to have considerable hæmorrhage. After this had been going on for some days Dr. Wilson saw her. The patient did not think she was pregnant.

Dr. Wilson found she was having attacks of bleeding pretty frequently. He found the uterus was considerably enlarged and lying towards the right side of the pelvis. The os was quite closed. When I saw her there was no actual bleeding. The uterus was about the size of a four months' pregnancy, and was somewhat displaced towards the right side. It felt very hard, and gave more the impression of a fibroid thickening, especially of the anterior wall, than an ordinary pregnancy. We concluded that the patient was pregnant, and that the enlarged and thickened condition of the uterus was probably due largely to subinvolution after the previous abortions.

I was on holiday at the time, and had no instruments with me, so had to postpone the operation to the following day, when Dr. Wilson, junior, gave the patient chloroform, and I dilated and cleared out the uterus. Severe bleeding had come on about an hour previous to the time arranged for the operation, and there was a good deal coming while I was operating, so I had to work very quickly. By means of a large sharp flushing curette I cleared out a considerable amount of decidua and old black blood-clot, and finally got away a fine specimen of a six or seven weeks old fœtus with an umbilical vesicle attached to it. The bleeding ceased as soon as the uterus was cleared out. I then plugged the cavity firmly with iodoform gauze. The patient was very blanched, and her pulse almost imperceptible, but a hypodermic of strychnine helped her considerably.

The plugging was removed next day, and the subsequent progress of the patient was very satisfactory. She had an uneventful recovery.

The operation of *curetting the puerperal uterus* is not devoid of risks. In some cases the uterine wall is very friable, and it may be perforated by the most skilful operator. Even in making an examination with the sound this may happen. The dilators may be pushed through, but the curette is the most likely instrument to cause perforation. You must therefore be very careful in all cases, as the friability of the uterine walls cannot be judged beforehand. Fortunately there is little risk from the accident if proper care is taken. After it has happened douching should not be done, as the fluid may pass into the abdominal cavity. The uterus should be wiped out carefully and plugged with iodoform gauze, taking care not to push the gauze through the rent. The rent is usually very small, and the edges of it fall together naturally, and they are soon glued together. If there is much bleeding, or the case is a septic one, the abdomen should be opened and the wound stitched. The parts should then be very thoroughly cleansed. In some of the cases reported the friability of the uterus rendered stitching very difficult, as the sutures could hardly be tied without cutting through the tissues. The uterus has sometimes been removed, but such an extreme step is rarely justifiable. Some observers have maintained that, in some cases when the sound or curette suddenly passes in a long distance, this is not due to perforation of the uterine wall, but to a sudden relaxation of the uterus. It is difficult to conceive of such an occurrence. When there is any foreign body in the uterus it usually contracts, and it is difficult to understand why it should act differently in these cases. Sometimes, however, the sound passes for some distance into one of the tubes, and this may be mistaken for a perforation. So far as I know, in all the cases in which the abdomen has been opened either a perforation or a patent tube has been found, so that I cannot accept this explanation of a sudden relaxation of the wall.

Procured Abortion.—There are a few conditions under which the procuring of an abortion may be justifiable—*e.g.*, in patients suffering from very bad chorea gravidarum, bad heart disease, bad kidney disease, uncontrollable vomiting, and an incarcerated retroflexed uterus which cannot be replaced. In the latter condition, however, it is preferable to do an abdominal section, and relieve the imprisoned uterus from above.

You should never undertake the operation without having a consultation. Occasionally an abortion is unwittingly procured by the passage of a sound into the uterus ; but it is possible to pass a sound during the first three months, and even later, without causing any mischief, provided the ovum is not punctured. I recently delivered a case of placenta prævia at the sixth month, where a dressed Playfair's probe, dipped in carbolic acid, had been passed into the uterus just before the patient quickened. She had been under treatment for endometritis before becoming pregnant, and her attendant had been misled as to her condition.

You are aware that the producing of an abortion, except in such cases as I have indicated, is a criminal offence. Few practitioners escape being barefacedly asked to commit this crime, and possibly being offered a large fee as an inducement. One cannot help feeling sorry for unmarried girls who have been betrayed, and can forgive them making such a request ; but in my experience it is married women, who do not wish to have more children, who are the worst sinners. The methods of prevention of conception, and of getting rid of the ovum, if conception has occurred, are now unblushingly discussed by women, and not by any means by women of the poorer classes only. This is probably the result of reading the new style of novel which is the very reverse of its predecessor, in which, as Kipling has it—

> " We asked no social questions—we pumped no hidden shame—
> We never talked obstetrics when the little stranger came."

The barefaced indecent advertisements which disgrace the pages of so many secular and even, I am sorry to say, of religious papers have much to answer for. They should be put down with a strong hand, but unfortunately the law seems powerless to deal with them.

The operation may be done by passing a sound and turning it round, so as to separate part of the decidua and puncture the ovum. It may then be left to come away naturally, and if it is not completely expelled, the retained portion must be dealt with, as in an ordinary incomplete abortion. The method I adopt is to cleanse the external parts and the vagina very thoroughly, and then pass an aseptic sound and turn it round. I then plug the vagina with iodoform gauze, pushing some of the gauze into the cervical canal. Next day this plug is removed, and the uterine contents are cleared out by means of the finger and the curette. Dilatation by means of Hegar's dilators will usually be necessary, but the dilatation will be much easier than if it had been done the day before. Some, however, prefer to clear the uterus at one sitting. This is suitable in the early weeks. The cervix is dilated by means of dilators, and the whole contents at once removed by the finger and curette. The operation must be done with the strictest aseptic precautions, or sepsis will be almost sure to arise. Even with the strictest aseptic precautions trouble may arise (see case of induced abortion for cardiac disease, p. 52).

The after-treatment in a case of procured abortion is exactly the same as after an ordinary one.

Criminal Abortion.—The procuring of abortion for criminal purposes seems to be more common in England than in Scotland. At all events, we rarely hear of the detection of cases here. Probably every medical practitioner, at some time or other in his career, has been asked to do the operation—*i.e.*, to commit a very serious crime. There is only one answer to such a request, and that is an emphatic refusal, no matter how great one's sympathies may be.

Sometimes one is called upon to treat a case where it is quite evident that an abortion has been procured. I have myself seen two cases where there was strong presumptive evidence that this had been done. In the first case the patient admitted that she had been examined with instruments, and had been taking drugs. A very septic placenta was still in the uterus. In the second, after the uterine contents were cleared out, the bleeding was so profuse that I had to plug the cavity with iodoform gauze. Both patients recovered.

Spurious Abortion.—Occasionally a cast of the uterus having the essential characters of the decidua of pregnancy, but with no trace of an ovum, is expelled after a period of amenorrhœa. Such a case is frequently seen in connection with extra-uterine gestation, but, in the cases referred to, there is no evidence of an ovum developing outside the uterus. The term "spurious abortion" has been suggested, but Fothergill has recently shown that the condition is really due to an "incomplete abortion," where the ovum has been expelled, leaving the decidua vera behind, or, as in his case, an early "missed abortion," in which the decidua went on growing for some time after the death of the ovum. There is no evidence to show that a decidua ever forms in the uterus apart from pregnancy, either topic or ectopic.

Prophylactic Treatment of Abortions.—If a woman has had one or more abortions she should be put under treatment before she again conceives, in order to prevent a recurrence of the abortion. The habit of aborting is said to be acquired, but, as I have already said, the probability is that this is really due to some form of uterine disease. If all abortions were properly treated there would be fewer recurrences. The patient should not resume intercourse until involution is complete and the endometrium in a healthy condition. If syphilis is present she should be put on antisyphilitic remedies. In such a case the husband should also be treated, but you must be exceedingly careful in dealing with such patients, as you may very easily upset the peace of a home.

If endometritis is present it should be treated, and intercourse prohibited until a cure is effected. If conception occurs before the endometrium is perfectly healthy, abortion will be sure to follow. The surest and quickest method of treating endometritis in such cases is by curetting. Any inflammatory condition of the ovaries or tubes should be cured, and all displacements rectified. If the cervix is split it should be repaired.

In cases of anæmia or other constitutional diseases, appropriate treatment should be adopted. There are certain cases in which the fœtus perishes in the later months of pregnancy. Fatty and calcareous degeneration of the placenta is generally found. These cases will be dealt with under Habitual Death of the Fœtus (see p. 389).

In all cases where abortions have occurred the patients should be warned to be careful at the times corresponding to their menstrual periods, and especially so at the time when the former abortion occurred.

VESICULAR MOLE, HYDATIFORM MOLE, CYSTIC DEGENERATION OF THE CHORIONIC VILLI.

The disease which is known under these various names is characterized by the hypertrophy of the chorionic villi, and their conversion into numerous cysts, varying in size from that of a millet-seed to that of a large grape. These cysts are all connected by pedicles of greater or less length, and the mass thus has somewhat the appearance of a bunch of grapes. After the third month of pregnancy the growth is very rapid, so that the uterus soon becomes very much more distended than it should be at that time of pregnancy. More or less discharge usually occurs. This may be of pure blood, but more frequently is a profuse watery discharge stained with blood. In some cases small cysts will be found in the discharge. The uterine contents are usually expelled before full time is reached, but in very rare cases the mass is carried *in utero* for some time beyond term. In some cases absolutely no trace of the fœtus can be found, in others only a portion of it may be present, but it is occasionally found entire, usually dead. In one or two cases the fœtus has gone on developing to full time and has been born alive, with a portion of the placenta showing cystic degeneration. As a rule, the disease begins early in pregnancy, before the villi have atrophied in the non-placental part of the chorion, and the whole chorion is thus affected. When it begins later in pregnancy, after atrophy has occurred, only the placental portion will be affected; if only a small portion, then development of the fœtus may not be interfered with. It occasionally occurs in twin pregnancies, the chorion of one fœtus being alone affected. The other twin may go on developing to full time. It is more common with multiparæ than with primiparæ, and may recur in subsequent pregnancies.

It is a true myxomatous degeneration of the chorion. The fluid in the cysts contain mucin and albumin in considerable quantities.

The mass may reach the size of an adult head. It may be completely covered over with decidua, but the enlarged villi not infrequently perforate one or both layers of the decidua at various places, and they may penetrate the muscular wall of the uterus and even the peritoneal cavity.

Of late it has been clearly shown that there is an intimate relationship between this disease and deciduoma malignum. A very large number of cases of the latter disease occur after vesicular moles.

Diagnosis.—There are three prominent indications of the condition. First the uterus is usually much larger than it ought to be at the supposed time of pregnancy, and the increase will have been very rapid after the third month; second, blood or blood-stained serum is discharged at intervals; and third, vesicles escape. Palpation of the uterus shows that it is very distended and has a boggy feel, and that no fœtal parts or movements can be made out. The uterus may be of an abnormal shape. Sometimes a crepitant sensation can be made out. Auscultation gives a uterine bruit but no fœtal heart, and a crackling or crepitant sound may be detected.

Prognosis.—The condition is not a very hopeful one, so a guarded prognosis should be given. If the mass has been entirely expelled naturally, there should be no immediate risk, but if a portion of it has been retained septicæmia is very likely to occur. In cases where the vesicles have penetrated the wall of the uterus, there is very great risk of rupture occurring when an attempt is made to remove the mass. In all cases the subsequent occurrence of *deciduoma malignum* is greatly to be dreaded.

Treatment.—If the hæmorrhage is great, plug the cervix and vagina thoroughly, until the os is dilated sufficiently to allow of expulsion of the mass, and then, if uterine effort fails, clear it out. In clearing it out the fingers only should be used, and the utmost care taken to prevent injury to the uterine wall. No curette should be used. In cases where there is no discharge and no uterine action going on, if you are perfectly sure of your diagnosis, you should induce abortion at once, as the longer the mass is in the uterus the greater is the risk of the uterine wall being perforated. In cases where a portion of the mass is retained, and sepsis has occurred, you should carefully explore the uterine cavity and remove the retained portion, but you must bear in mind that the uterine wall may be very thin in places. If the wall has been perforated, the best treatment would be to remove the entire uterus, either through the vagina or abdomen. In all cases the most rigid aseptic precautions must be taken.

CHAPTER XVI

HÆMORRHAGES OF THE LATER MONTHS OF PREGNANCY—ACCIDENTAL HÆMORRHAGE

Varieties of Accidental Hæmorrhage—Time of Occurrence—Ætiology—Cases—Diagnosis—Treatment—Case—Treatment of the Concealed or Internal Variety.

We have now to take up the hæmorrhages which occur in the later months of pregnancy—*e.g.*, from the sixth month onwards—the ante-partum hæmorrhages. We have two varieties, viz., accidental and unavoidable. We shall first deal with the accidental. The hæmorrhage arises from the separation of a normally situated placenta—*i.e.*, a placenta situated in the uterine cavity anywhere above the lower uterine segment. By the lower uterine segment is meant the part which becomes thinned out during the canalization of the genital tract. If the placenta is attached anywhere in this lower uterine segment, separation of it is sure to occur during labour, and this gives rise to the unavoidable form of hæmorrhage. Such a case is said to be one of placenta prævia, which we shall discuss fully in our next chapter. What I wish to point out to you now is, that in both cases the hæmorrhage is caused by separation of the placenta. In the accidental the placenta is normally situated, while in the unavoidable it is in the lower uterine area. In both the blood comes principally from the uterine sinuses, and only a small amount from the torn placenta.

Varieties of Accidental Hæmorrhage.—There are two varieties, viz., external and concealed; but we might add a third, viz., a mixed form in which we have both external and concealed hæmorrhages. In fact, in most cases of external hæmorrhage there is more or less clot in the uterus. The concealed is one of the most serious complications we have to deal with in midwifery. With the exception of rupture of the uterus, there is no accident so fatal to the patient. Fortunately it is comparatively rare.

Accidental hæmorrhage is more frequent in multiparous than in primiparous cases, but it occasionally does occur among the latter. It resembles an abortion in this respect, and in fact it is practically an abortion occurring in the later months. It occurs in the same class of cases, and from much the same causes.

Time of Occurrence.—It occurs from the sixth month onward to full time.

Ætiology. — The ætiology is much the same as in cases of abortion. In all the cases I have examined carefully I have found the placenta more or less degenerated. A perfectly normal placenta might become detached as the result of a severe accident, but this is very exceptional. In the majority of cases I believe there is more or less disease of the placenta present, due usually to endometritis. The exciting cause may be direct violence, such as a kick or blow upon the abdomen, overexertion, overstretching, such as in reaching something above the head or in hanging up clothes, shock, fright, severe vomiting, severe coughing, and severe straining at stool. In some cases there may be no apparent exciting cause.

For some reason or other, then, a small portion of the placenta becomes detached, and a utero-placental sinus torn through. A greater or less amount of blood is poured out between the placenta and uterine wall. If it is at the lower edge of the placenta, it will quickly find its way down between the membranes and the wall. It may clot there, or work its way down by gravitation until it appears externally. If the amount be very small no harm may result; but it is almost sure to act as a foreign body, and set up uterine contractions, which will cause more of the placenta to be separated, and, of course, more hæmorrhage. In the concealed form the blood is retained in the uterus, and does not appear externally at all, but there is usually a profuse flow of serum, which is pressed out of the clots. Sometimes you have what might be called a mixed form, where there is some external bleeding, but a very large quantity of blood remains in the uterus. In the external variety a clot or clots will be found in the uterus, but the greater part of the blood escapes externally. The blood is said occasionally to burst through the membranes and mingle with the liquor amnii, but I have never seen a case of this kind. In the concealed form the uterus becomes very much distended, more oval in form, and you may be able to feel masses in it, indicating where clots are lying. You will not be able to feel the fœtal parts. The woman will complain of a continuous rending pain, as if her uterus were going to burst. If she is a multipara, she will tell you the pain is very different from any pain she had felt in former labours. This is a symptom of the utmost importance, and one to which I wish especially to direct attention. It is mentioned in text-books, but I do not think sufficient stress is laid upon its importance. If the case is at all a serious one, the patient will show all the signs and symptoms of hæmorrhage and collapse, which I need not enumerate.

Prognosis.—In the concealed variety the prognosis is exceedingly grave, as, unfortunately, the condition is often not recognised until the patient is collapsed. In the external variety the danger is not nearly so great, as assistance will be sent for early. If the cases of the external form are seen early, before collapse, the great majority should be saved. The mortality for accidental hæmorrhage is said to be 50 per cent. This is far too high, taking all the cases together, but for the concealed variety alone it is not high enough. Very few of them are saved.

As regards the children, in bad cases they are nearly all lost, but in slight cases they may be saved. Many of them are premature. If the placenta is entirely separated, the child will be dead. The child's chances, then, may be said to depend upon the amount of separation of the placenta, and also the ease of delivery. It may be too premature to survive, and at the best is likely to be weakly.

Before taking up the diagnosis and treatment I shall give you notes of two cases, one of each variety.

Case I.—The patient was a multipara, seven months pregnant, attended at her own home. She had been bleeding for sixteen hours before I saw her. She stated that she had been very constipated, and the night previous had been straining very heavily at stool, when she suddenly found blood was pouring from the vagina. She said she had very nearly filled the chamber-pot. This was, of course, an exaggerated statement. The bleeding had continued, more or less, ever since. Three hours before I saw her the vagina had been plugged on the supposition that it was a case of placenta prævia; the os was then about the size of half a crown. I found her pulse very feeble, and her lips blanched. She was in a state of collapse from hæmorrhage. The os was now fully dilated, the membranes intact, and the head presenting. The membranes were at once ruptured, and the forceps applied. Delivery was easy. The child was dead. Firm pressure over the uterus immediately expelled three or four large black clots and the placenta, which had been completely separated. A hot douche checked all post-partum hæmorrhage. Ergotin and ether were given hypodermically, and an injection of saline fluid into the rectum, and a pint of the same into the areolar tissues of the right axilla. Her pulse, which had been barely perceptible after delivery, quickly improved. She made an excellent recovery.

CASE II.—Mrs. E., aged forty-one, multipara. This patient was sent into the hospital as a case of placenta prævia. The history given us was that she had begun to bleed about 4 a.m., and that the bleeding had continued, more or less, ever since. The only cause she could give was that she had done a heavy washing the day before. She had been seen a few hours after the onset, and the vagina had been plugged. The plug had been removed twice and a fresh one put in. The third plug was still in.

On admission at 4.15 p.m., twelve hours after the onset, she was perfectly blanched; her lips were of a bluish-white colour and absolutely bloodless. The pulse was 120 and very soft. She continually complained of a rending pain in her abdomen, as if she were bursting. The abdomen was very much distended and globular in shape. The fœtal parts could not be palpated. The os admitted two fingers, and no placenta could be felt.

She was given some stimulant by the mouth and a saline rectal injection. Champetier de Ribes' bag was inserted and partially filled. In a few minutes it was withdrawn and the os dilated manually until the hand passed. The membranes were ruptured and a foot brought down, and delivery of a premature dead child, which weighed 2½ pounds, quickly effected. The placenta, which had been completely separated, and a very large quantity of clot, were at once cleared out of the uterus. During this time the uterus was actively compressed, and hypodermic injections of ergotin and strychnine were given. A creolin intra-uterine injection (115° F.) checked the post-partum hæmorrhage; in fact, there was no blood lost after delivery, as, unfortunately, there was none to lose. Another saline rectal injection was given, and also one into the areolar tissues under the left breast. She was now practically pulseless. In spite of active stimulation, she died in half an hour.

I shall refer to this case when discussing the best methods of treatment.

This year I had to deal with an almost similar case. The patient was seen at her home by an outdoor house surgeon, who found her bleeding profusely. He thought the case was one of placenta prævia, so he plugged the vagina and had the patient removed to hospital. When I saw her she was extremely collapsed with a greatly-distended uterus. In this case I would have done a Porro's operation, but the patient had been vomiting blood, and I believe she had an ulcerated stomach. The os was dilated sufficiently to deliver, and I did so at once, after a saline transfusion. The uterus was full of clot. The patient died very shortly after delivery.

Diagnosis.—In the external variety there will be bleeding from the uterus. The patient may or may not be having uterine contractions, if it is before full time, but they will soon come on. If the hæmorrhage is profuse, the pulse will become rapid and weak, and signs and symptoms of collapse supervene. In some cases the amount of collapse will be much greater than the apparent loss of blood accounts for. In such cases there will be concealed hæmorrhage as well, making it much more dangerous. The os may not be much dilated at first, but you will usually be able to get your finger in. The cervical canal will usually be found full of clot, which may easily be mistaken for the placenta. You can break down the clot and remove it, while this cannot easily be done with the placenta. You will not be able to reach any placental tissue with your finger.

You will have to diagnose the external form from unavoidable hæmorrhage due to placenta prævia, and the concealed from rupture of the uterus or other viscus. Mistakes are frequently made between the external variety and unavoidable hæmorrhage. In the three cases I have related this happened. Until the os is dilated sufficiently to admit the finger a differential diagnosis may be impossible. If the placenta can be reached, that will settle that it is a case of placenta prævia. A boggy feeling in the fornices is also indicative of placenta prævia. You will see it stated that in accidental hæmorrhage there will be no bleeding during the pains, as the presenting part will effectually block the passage, while in placenta prævia the bleeding will increase during the pains. In my experience, which has been a pretty large one, you can place absolutely no dependence upon this. In accidental hæmorrhage the contractions will squeeze out any blood which is in the lower part of the uterus and cervix, and, besides, in many cases the presenting part does not block the passage. In a case of lateral or marginal placenta prævia, if the head is well down during the uterine contractions, it will effectually plug the passage and prevent any bleeding.

In the concealed variety there may be some hæmorrhage showing, but often there is only a copious serous discharge, and even that may be absent, as in case (Mrs. K.) on p. 184. The patient will be in a state of collapse. The uterus will be oval in shape and very much distended. You will not be able to palpate the fœtus, but you will often be able to make out irregular masses in the uterus indicating where the clots are lying. The patient will complain of a continuous rending pain in the uterus. Rupture of the uterus gives much the same condition of collapse, but it occurs as a rule in the second stage of labour. In complete rupture the uterus will usually be smaller than it was before, and the presenting part will have receded. In partial rupture the signs and symptoms are almost identical, but it occurs almost always late in the second stage, while the hæmorrhage is always in the first, or before labour has set in. Rupture of an internal viscus—*e.g.*, stomach or bowel, would give the same collapse. An examination would reveal that the uterus was of normal size and shape.

Treatment.—The proper treatment of each case depends upon the conditions present. To lay down one hard-and-fast rule of procedure is absurd. Let us first consider the external variety. We will first suppose a case where the hæmorrhage is not very great and the uterus is not distended. If the membranes are ruptured and a tight binder applied, this is usually sufficient, provided contractions are occurring, but you must watch the pulse carefully for fear of concealed bleeding going on. Where contractions are going on plugging of the vagina may be resorted to to hasten dilatation. In such a case there will be no risk of converting it into a concealed hæmorrhage. If the uterus does not contract when the liquor amnii flows away, you can easily see the pressure inside the uterus will be lessened and bleeding encouraged. If the external hæmorrhage continues, or if there is evidence of internal hæmorrhage, steps should at once be taken to hurry dilatation and delivery. The dilatation may be effected by means of Barnes' or Champetier de Ribes' bags, or manually, or by Bossi's dilator. Bossi's instrument is most useful in such cases. As soon as the os is sufficiently wide, turn by either method and bring a leg down. Keep up active stimulation of the uterus by kneading it to encourage contractions. If the os is not sufficiently dilated to allow of the head passing easily, beware of dragging it through forcibly, or you may rupture the cervix and add a very serious risk. In some cases forceps may be used, but as a rule turning is the better method. As soon as the child is born the uterus must be actively compressed, and in most cases the hand should at once be introduced into the uterus to clear out the clots and placenta. A very hot douche (120° F.) should be given at once, and ergotin hypodermically. These active measures require to be adopted to prevent post-partum hæmorrhage, which is apt to occur. If the case has been a severe one, saline fluid (1 drachm of common salt to a pint) should be injected either directly into a vein or into the areolar tissues of some part of the body. It can also be given into the rectum. The patient should be freely stimulated with brandy, ether, or strychnine. In a very bad case it would be well to transfuse before attempting delivery. I shall deal with the methods of transfusion and treatment of collapse from hæmorrhage when discussing post-partum hæmorrhage.

I shall now give you the history of a case, which illustrates the serious risks one runs in hastening dilatation and delivery under any circumstances.

CASE III.—Mrs. T., aged twenty-seven, 2-para. This patient had been delivered by me on October 1, 1896, of her first child by craniotomy. The cord was prolapsed and pulseless. Her pelvic measurements were as follows: Interspinous, 10¼ inches; intercristal, 10½ inches; external conjugate, 7 inches; diagonal conjugate, 3⅞ inches. The true conjugate would be about 3¼ inches.

According to instructions, she came back for induction when seven and a half months pregnant. She was admitted into the Glasgow Maternity Hospital on October 1, 1897. A bougie was passed into the uterus, and the vagina plugged the evening of admission. The plugs were removed sixteen hours later. The os was the size of a shilling. During the next twenty-four hours not much progress was made. On the evening of October 3, I found the os would admit two fingers and was fairly dilatable, so I determined to put in a Champetier de Ribes' bag, and leave it in until the os dilated. The bag was easily introduced without giving chloroform, the patient lying on her left side. Warm carbolic lotion was pumped in through a Higginson syringe, and before the bag was nearly full the patient suddenly became blanched and the pulse grew very weak. The syringe was detached from the bag and the fluid allowed to run out; only a little came through the tube, and it was blood-stained, but a gush of blood-stained fluid came from the vagina. The bag was withdrawn at once, when there was a tremendous gush of blood. The bag had a rent nearly 1 inch long in its side. As the uterus showed no indication of contracting, and the hæmorrhage continued, Dr. Black agreed that I ought to dilate manually, and turn at once. This was easily effected, as the cervix yielded readily to my hand. The body was drawn down and the arms freed. The uterus was still very flabby, and I was afraid that internal bleeding might continue, and as I was also anxious to save the child, I delivered the head at once by suprapubic pressure combined with not very great traction on the body. The child was alive, and weighed 6¼ pounds. The placenta, which was partially in the vagina, was removed. It had been attached low down and was very soft, evidently fatty. A hot intra-uterine creolin douche (120° F.) was given, and the uterus, which had been very flabby, soon contracted firmly. A hypodermic injection of ergotin (3 grains) and another of ether (20 drops) were given, and 1 pint of saline solution by the rectum. The cervix was torn considerably, but the hot douche seemed to check the hæmorrhage. The patient had rallied, and said she felt better. Her pulse was 92, and of fair strength. She was then made comfortable and a firm binder put on, but in about ten minutes, perhaps half an hour after delivery, her pulse became very feeble (120), and she looked decidedly blanched. Bleeding had recurred, evidently from the cervix, as the uterus was fairly firm. The foot of the bed was raised at once, and 2 ounces of brandy and 2 ounces of water injected into the rectum. Another hot douche (120° F.) was given by me, while, at the same time, Dr. Webster opened the median basilic vein and transfused 6 pints of saline fluid. The pulse improved for a time. As the hot douche failed to check the oozing, I plugged the cervix and vagina with iodoform gauze. Hot applications and stimulants were used freely, but she gradually sank, and died two and a half hours after delivery.

We got permission for a post-mortem, but, unfortunately, the body was removed without the resident's knowledge before we could have the examination made.

Two other De Ribes' bags have burst in my hands, but, fortunately, the others burst in the vagina. In this case the burst was high up, and the fluid separated the placenta, which was very friable and situated low down. The bag is a large one, and from the point which was in the os to the top it measures fully 4 inches. As it distended the membranes would be stripped off the uterine wall and be pushed up before it. The lower edge of the placenta may even have been slightly separated by the strain on the membranes before the bag burst. Of course that had nothing to do with the tearing of the cervix, except that it forced me to deliver by *accouchement forcé*. If I had delayed the delivery of the head and sacrificed the child, the mother might have been saved. One can always be wise after the event. This case illustrates the grave risk incurred in rapid delivery.

This bag seems to be made of some preparation of rubber. The one I have for private use is made of silk, and sewed. I do not think it would burst, but it is very difficult to render such a bag aseptic. These rubber ones, I imagine, have been made so that they may be easily rendered aseptic. I shall certainly never use one of them again.

The silk one, I have found, does well; but, after such an experience, I cannot so strongly commend their use, as is done by some obstetricians.

The methods of treatment I have given you are the ones I have found most efficacious, but you will find a very different method described in Jellett's "Short Practices of Midwifery." In the preface to that work Smyly says: "In the first two years of my mastership I treated all serious cases of accidental hæmorrhage by rupturing the membranes, and, if that did not prove effectual, delivery was effected by version and extraction or perforation. The results were so bad that I resorted to plugging in all cases of external hæmorrhage in which the membranes were intact and labour pains absent or feeble—that is, in the great majority of cases—and with excellent results. The fear that an external would be converted into an internal hæmorrhage proved groundless." The two cases already given show that this fear is not groundless. In both it began as an external form, but was converted into an internal by the plugging.

Jellett strongly advocates the plug. He says: "If the blood cannot escape, then it must cease flowing as soon as the cavity is full. There is no room for any considerable quantity of blood to escape into a healthy uterus occupied by an unruptured ovum. If a vessel rupture in such a case and no blood escape through the os, the pressure in the uterus would rapidly become greater than the blood pressure, and the hæmorrhage would cease. If, on the other hand, the uterus be unhealthy and dilate before the blood pressure, then the amount of the hæmorrhage is only limited by the dilatability of the uterus." This is all true enough, but the unfortunate thing is that we rarely have to deal with a healthy uterus. If it were healthy, the placenta would not separate except under very exceptional circumstances. The placentæ, in the cases which I have examined, have all been in an unhealthy condition. Jellett says the hæmorrhage is primarily due to an endometritis. A uterus with endometritis is not a healthy one.

Nature's method of checking hæmorrhage is not by pressure, but by contraction and retraction of the uterine muscular fibres. The only way to get that is by emptying the uterus, a practice I have always carried out when any active hæmorrhage was going on and uterine contractions were not active. In a large number of cases of the external variety, the only one I have lost was that of Mrs. T., just related, and it was a very exceptional one. I am afraid I was too anxious to get a live child in that case, and it was of course complicated by a considerable contraction of the pelvis. Rupturing the membranes may suffice when active contractions are going on, but I would never trust to it entirely if there had been much hæmorrhage. If hæmorrhage is going on and there are no active contractions, I think the best treatment is to dilate and deliver, with due precautions not to lacerate. If the hæmorrhage has ceased and the patient is not collapsed, you may wait and watch her. If she is very much collapsed, you should stimulate her and give a saline injection before delivery, lest the shock of the delivery prove fatal, even without any post-partum bleeding. The treatment of the external form is comparatively simple, but in the concealed we have a much more serious difficulty to face.

Treatment of the Concealed or Internal Variety.—Jellett says : " The only treatment which is of any avail in these cases is the *accouchement forcé*, or Porro's operation." The former I have tried, and I must confess the results have not been encouraging. Rupturing the membranes has been advocated, but this I consider dangerous, as the uterus is paralyzed and will not contract, so that the escape of the liquor amnii makes more room for blood to be poured out. If *accouchement forcé* is decided upon, the patient should first be freely stimulated and given a large injection of saline, either into the areolar tissues or directly into a vein. As soon as the child is delivered the uterus should be emptied of the placenta and clots, and every effort made to get it to contract by hot douches, ergotin hypodermically, and firm suprapubic pressure.

Porro's operation I have not tried, but it has been done with success. In a hospital it could be adopted, but in private work I am afraid one could hardly do it.

I have done a Cæsarian section in a case of external accidental hæmorrhage with good results to both mother and child (see Case VII., p. 521).

Case.—Mrs. K., aged forty-five years, 10-para, full time, was seen at her own home by a nurse who found her very collapsed and almost pulseless. The nurse at once diagnosed concealed accidental hæmorrhage, and called the house surgeon. He stimulated the patient freely, and removed her into hospital as quickly as possible.

Previous History.—The patient's first five pregnancies had been normal, but the last four had all been accompanied by hæmorrhage. At the sixth and ninth confinements she had had severe post-partum hæmorrhage, while the seventh and eighth pregnancies had ended in abortions with such profuse hæmorrhage that she nearly bled to death. On the evening of the day before admission labour commenced, and she had ordinary pains during the night. She got up in the morning, and while walking across the floor she was seized with sudden acute pain in the abdomen and fell in a faint.

Condition on Admission.—The patient was bathed in a cold clammy sweat, the pulse averaged 136, and the temperature was 97° F. She was extremely pallid. On palpation the uterus was found to be more oval in outline than normal. The fœtal parts could be felt with some difficulty. There was no marked pain on manipulation, but she complained of a dull continuous pain in the upper and left quadrant of the uterus and in the back. The fœtal heart could not be heard. The fundus was near the ensiform cartilage. A vaginal examination revealed that the os was one-third dilated, the membranes intact, and the head movable at the brim. There was no blood coming away, neither was there any serum.

The patient was given more stimulant (strychnine and brandy), and when I saw her shortly afterwards I found her pulse was 120, and with a fair volume. The uterus had now commenced to contract, and the fœtal parts could not be palpated. When I examined vaginally I found the membranes had just ruptured, and the head was being pressed into the brim. There was absolutely no bleeding, not even when I pushed the head up out of the brim.

A saline infusion of a couple of pints was given, and preparations were made for a Porro's operation, but I decided to wait and watch the patient closely, stimulating her freely. The internal bleeding had evidently ceased, and I felt that the best chance for the patient was to allow her time to rally. Four hours later I found she was having strong expulsive pains, and a dead child was quickly expelled. After the birth of the child no blood escaped from the vagina. On palpation the uterus was felt to be large, soft, and bulged towards the anterior abdominal wall. I introduced my hand, and found the placenta completely separated and lying among a large number of clots. The uterus was cleared out, and a hot douche given. It retracted well. There was no post-partum hæmorrhage. Three pints more of saline solution were infused.

After delivery the patient was really in a better condition than she had been at the time of admission.

She died three days later from asthenia. There was no bleeding from the uterus. The pulse ranged from 130 to 140, and the temperature remained at about 100° F. On the second day the pallor became of a greenish yellow-tinge. Her blood glands apparently did not perform their functions, so the condition was one of pernicious anæmia. Both the patient and her friends stated that for a considerable time her colour had been very bad.

The placenta weighed 2 pounds, and showed a number of fibrous infarcts.

The amount of clot I had removed from the uterus was not at all excessive, and if the woman had not been very anæmic prior to the bleeding, I am quite sure it would not have seriously affected her.

At the post-mortem examination all the organs were found to be extremely pale, and the endometrium was in a very unhealthy condition.

CASE II.—At 10 a.m. on the morning of admission to the Maternity Hospital, the patient, Mrs. S., 6-para, aged thirty-one, suddenly became faint and perspired freely. She had not overexerted herself in any way. She was admitted at 3 p.m. She was very pale, with a cold, clammy skin and livid lips. The pupils were dilated, and the breathing shallow and irregular. The pulse was 94, and the temperature 97° F. There was no external evidence of hæmorrhage. The abdomen was distended, rigid, and tender to pressure. The fœtal parts could not be distinctly palpated. No fœtal heart could be heard. Vaginal examination showed the os to be half dilated and the vertex presenting. There was no discharge from the uterus. The patient complained of a continuous pain in the abdomen.

As the cervix was very soft and dilatable, I decided to deliver her at once by *accouchement forcé*. The patient was anæsthetized, the os manually dilated, and delivery effected by version. The uterus was firmly compressed, and the placenta, which had been completely separated, and two very large clots were expelled. One of these clots was about the size of an ordinary liver, and not unlike it in shape. There was a good deal of decidual tissue over the surface which had lain against the uterine wall. As the uterus would not retract well, it was very firmly plugged with iodoform gauze after a hot douche had been given. Two pints of saline solution were infused, and $\frac{1}{30}$ gr. strychnine was given. The pulse was scarcely perceptible. The foot of the bed was raised. The following day another saline infusion was given. The plug was left in the uterus for forty-eight hours. On its removal, there was no bleeding. The temperature ranged between 99° and 102° F. for about a fortnight, but there was nothing to account for it. There was also a good deal of diarrhœa. The skin was of a lemon-yellow tint and the mucous membrane blanched. I was afraid the case would end in pernicious anæmia, but under large doses of iron and arsenic the blood condition improved considerably, and the patient was discharged in a fairly good condition.

If the cervix had not been very soft and easily dilated, I would have done a Porro's operation.

CHAPTER XVII

THE HÆMORRHAGES OF THE LATER MONTHS OF PREGNANCY (*continued*)—UNAVOIDABLE HÆMORRHAGE FROM PLACENTA PRÆVIA

Bandl's Ring—Retraction and Contraction—Definition of Placenta Prævia—Average of Occurrence—Time of Occurrence of the Hæmorrhage—Source of the Hæmorrhage—Causes of Placenta Prævia—Signs and Symptoms—Diagnosis—Prognosis—Treatment.

THE next form of hæmorrhage we shall consider is the unavoidable, which arises from the condition known as placenta prævia. In these cases the whole, or part, of the placenta is attached to the lower uterine area or segment, or that part of the uterine cavity which lies below the retraction, or Bandl's ring.

What is the Retraction Ring, and Where does it Lie?—It is a muscular ring which marks the junction of the lower uterine segment with the active part of the uterus. The lower uterine segment is the part which, during labour, becomes stretched and thinned out, or, in other words, becomes canalized, just as the cervix and vagina do. It remains passive. In the full-time uterus the upper boundary of the lower uterine segment lies from 2½ inches to 3½ inches above the os internum. The peritoneum over this segment is loosely attached, and becomes closely adherent just at the position of the ring. A large circular vein is usually found in the wall at the ring.

As labour advances, the lower uterine segment thins out or becomes stretched, and the retraction ring rises higher and higher in the abdomen. In ordinary cases the ring is not palpable, but if there is any obstruction to the advance of the presenting part it will soon become apparent to the touch. Whenever the retraction ring can easily be felt, you have an indication that there is danger of the uterus rupturing.

The drawing (Fig. 21) shows the ring very markedly. It was obtained from a case of rupture of the uterus which was brought into the Glasgow Maternity Hospital from the country. She died a few minutes after

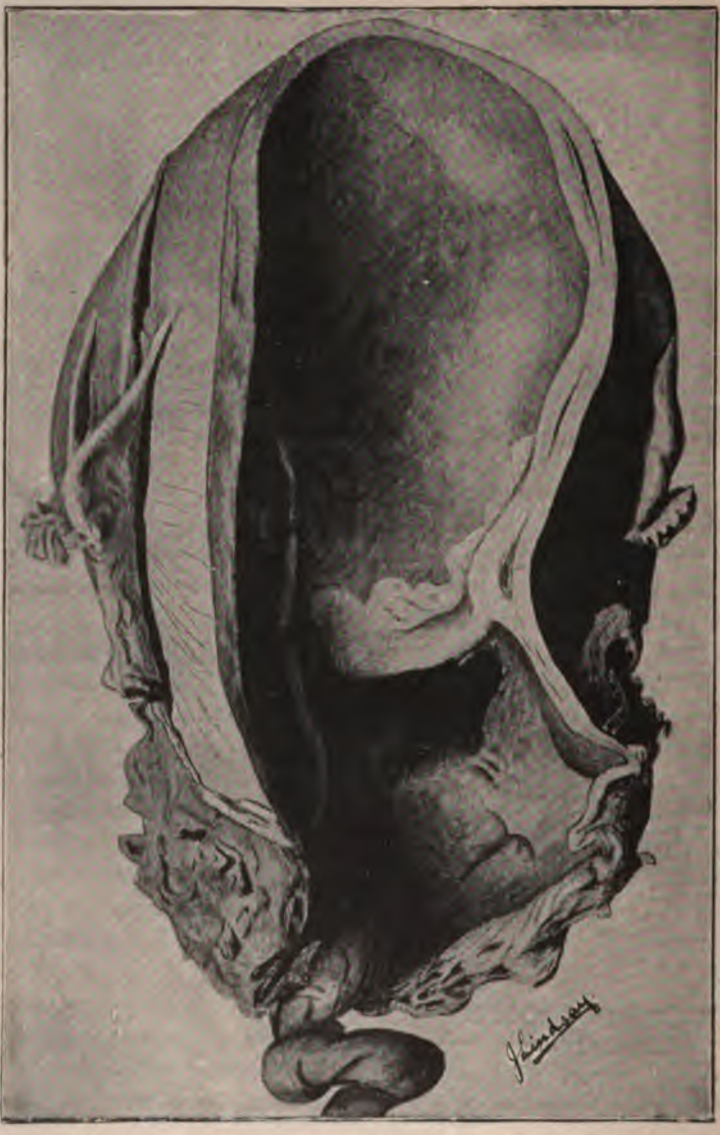

Fig. 21.—Partial Rupture of the Uterus, showing the Retraction Ring.

admission, and we removed the uterus post-mortem. The uterus with the child *in situ* was hardened in formalin, and now that the child has been removed, and the posterior wall cut away, you can see the ring very distinctly, forming a ledge right round the interior. You will notice how this lower part of the uterus below the ring has been thinned out. The peritoneum over it is loosely attached, but firmly adherent at the ring. The rupture, you will observe, is the exact shape of the back of the closed hand. It only extends through the muscular layers. The loose peritoneum, you will notice, has allowed of a large quantity of blood being poured out under it. In fact, there was a large hæmatoma round the greater part of the uterus and extending into the broad ligament. The circular vein is also apparent. The patient's pelvis was not contracted, but the child presented by the face with the chin posterior. It was a very large child, and the face could not enter the brim. Attempts were made to deliver with forceps, and, unfortunately, when these failed, version was tried. By this time the liquor amnii had been away for some time, and the lower uterine segment had become dangerously thinned out, as you can see. When an attempt was made to pass the hand in to grasp a foot, incomplete rupture took place, and a large amount of blood was poured out under the peritoneum. The woman collapsed, and by the time she was brought to us from some distance in the country she was moribund. In passing, I may say the proper treatment in this case would have been version early, if it could not have been converted into a vertex presentation, before the lower uterine segment had become thinned. Craniotomy should have been done instead of an attempt at turning after forceps failed. Early version would have saved the mother, and very probably the child also. I shall refer to this again, but in passing I would like to insist that if you fail to deliver with forceps—*i.e.*, if the instruments do not slip—never attempt to turn. You will not be likely to save the child, and in many cases you will cause the death of the mother by rupturing the uterus. This statement refers to vertex as well as face presentations. I am well aware that turning, after failure with forceps, is a common practice, but I have seen the terrible result of rupture of the uterus in quite a number of cases brought to the hospital in a moribund condition.

Retraction and Contraction are two terms which are used frequently in describing labour. They refer to what takes place in the muscular fibres of the uterus. In contraction of a muscle the fibres shorten, and when relaxation takes place they return to their original length from the elastic reaction. Retraction is something more than this. In relaxation the fibres do not return to their original length, but remain somewhat thickened and shortened. This is what is known as retraction. Contraction is temporary and transient, but retraction is permanent and progressive. The uterine wall above the retraction ring contracts and retracts and becomes thickened, while below the ring it thins out. In Cæsarian section operations this is sometimes very clearly shown. The retraction ring, if cut through, can be plainly seen ; the uterine wall above it will be quite thick, while below it will be thin.

It is the retraction of the uterine muscular fibres which is the great factor in preventing hæmorrhage. If a uterus remains big and flabby after the child is born hæmorrhage will come on, but if it becomes firm and remains so, there is no risk. We usually speak of it being well contracted when it assumes the cricket-ball shape and feel, but it would be more accurate to describe it as well retracted.

Definition of Placenta Prævia. — Placenta prævia is defined as the implantation of the placenta, in whole, or in part, in the lower uterine area—that is, in the part of the uterine cavity which lies below the retraction ring, or the part which stretches during labour. This part, as I have already said, lies between the os internum and about 2½ inches to 3½ inches above it, and is characterized by : (1) its thinness ; (2) the longitudinal arrangement of the muscle-fibres ; (3) the loose attachment of the peritoneum ; (4) the presence of a circular vein at its upper limit. The placenta is never attached to any part of the cervical canal, but may be entirely over the os internum. As this part of the uterus must expand or stretch during canalization of the tract, the placental attachment must necessarily be torn through, and rupture of the utero-placental sinuses occur, hence the hæmorrhage is known as unavoidable.

Average of Occurrence.—It is said to occur about once in a thousand cases, but in my experience it is much more frequent. It is said to be very rare with twin pregnancies. The late Dr. Angus Macdonald, I believe, put the average with twins as once in 44,500 labours—not twin labours, of course. I have been going through the books of the outdoor department lately, and have found one case in about twenty-five years' work, but, curiously enough, during the last year there have been two cases in the hospital under my care. I have also had one in private practice within the last few years. They are certainly rare, but not so rare as Macdonald believed. Like accidental hæmorrhage, the unavoidable form is much more frequent in multiparous than primiparous cases.

In the outdoor department of the Glasgow Maternity Hospital it occurred 105 times in 41,111 labours (1 in 391), and in the indoor 63 times in 10,179 labours (1 in 161). By combining the two we get 168 cases in 51,290 labours (1 in 305). The estimate from the outdoor cases is pretty nearly correct, while that for the indoor is too high, because many of the cases are sent in by outside doctors. In the year 1900 our average in the indoor department was about 1 in 50.

Time of Occurrence of the Hæmorrhage.—It usually occurs from the sixth month onwards. A large number occur during the seventh month. The patients do not generally go to full time. As I have already stated in a former chapter, some cases of placenta prævia abort in the early months.

Varieties.—Two varieties are sometimes described—viz., first, *complete* or *central*; second, *incomplete* or *partial*; but more frequently three varieties are given, viz., first, *complete* or *central*, when the placenta completely covers the os internum; second, *partial* or *lateral*, when the os is approached or partly covered by the placenta; and third, *marginal*, when only the margin of the placenta extends into the lower uterine segment. This latter form is probably more common than is generally supposed. When slight hæmorrhage occurs during labour, as it not infrequently does, it probably arises from the separation of a small portion of placenta, which has been attached below Bandl's ring. The incomplete or partial of the first classification includes the partial and marginal of the second.

Source of the Hæmorrhage.—The main source is from the utero-placental sinuses, but a little comes from the placenta when a cotyledon is partially torn, and some from Meckel's sinus. The main blood-supply to the sinuses is from a branch of the uterine artery, which passes downwards through the uterine wall to the curling arteries, which pass to the decidua and open into the sinuses. The blood is carried back by veins into venous sinuses in the uterine wall. There is thus a very free blood-supply. Where the arteries and veins pass through the spongy layer of the mucosa they are thin-walled and easily torn. In an ordinary case of labour, when separation occurs during the third stage, there is very little bleeding, because of the retraction of the uterine muscular fibres compressing the branches of the arteries and veins, and practically closing them up; but in a case of placenta prævia there is no retraction of the lower uterine segment to do this, therefore the bleeding is profuse.

The actual cause of the separation of the placenta is the increase in area of the lower uterine segment. In full dilatation this area increases over two and a half times, but a very much less increase is sufficient to cause detachment. The placenta cannot expand to keep pace, as it were, with the expansion of its site, so the attachment must be torn through. In some cases you have hæmorrhage occurring before dilatation can be detected. These are really cases of accidental hæmorrhage in a case of placenta prævia. You can easily understand how any of the causes I have already given you of accidental hæmorrhage with a normally attached placenta would be much more potent if the placenta were situated in the lower uterine area.

Causes of Placenta Prævia.—It arises from a low implantation of the ovum. Some observers maintain that it is due to the placenta developing over part of the decidua reflexa. Webster has published drawings of a case which proves this. In many cases there has been antecedent uterine disease. I have seen four where endometritis had been present before impregnation. In such cases the uterine cavity is enlarged, and this would allow of the ovum slipping down to the lower part. This would also account for the greater frequency among multiparæ, and for the fact that when it does occur in a primiparous woman she is usually an elderly one.

Signs and Symptoms.—The chief sign is hæmorrhage, the onset of which is sudden, without any apparent cause, as a rule. It frequently occurs when the patient is in bed. The first attack may be slight, ceasing in a little, to recur in some hours, or days, or even weeks later. On the other hand, it may be very severe and persistent. At first, as a rule, no pain will be felt, but after a time contractions will set in. You will find it stated that the hæmorrhage occurs during the pains, as the placental attachment is then being torn through and the sinuses opened into. As a matter of fact, the contractions of the uterus tend to lessen the blood-supply for the time being by compressing the uterine arteries ; but they also tend to press out the blood which has already escaped. In the lateral and marginal variety the contractions, by driving the presenting parts down, compress the placenta and stop the hæmorrhage, just as a plug does. In my last chapter I pointed out that the occurrence of hæmorrhage during the pains was no indication that it was a case of placenta prævia, and not one of accidental hæmorrhage.

If the hæmorrhage is great, the patient will show signs and symptoms of collapse—viz., pallor, weak and rapid pulse, restlessness, ringing in the ears, faintness, etc.

A vaginal examination may not reveal much. The os may be completely closed and the presenting part not felt, as malpresentations are very common, both from the case being premature, as a rule, and from the altered shape of the uterine cavity. You may be able to make out a thickened boggy feeling in the fornices. In most cases, however, the os will be sufficiently open to allow a finger to pass, and the placenta to be felt. This can easily be done in the central and lateral variety, but in the marginal you will have to pass your finger well in and sweep it round. The placenta feels rougher than a blood clot, and cannot be broken down easily.

Diagnosis.—A case of sudden hæmorrhage, from the sixth month onwards to full time, must either be due to accidental hæmorrhage or placenta prævia, except in rare cases of injury to the vagina or cervix, or cancer of the cervix. The history of the onset will not help you much. You will have to depend on an examination. If the cervix will admit your finger, as it usually will, and you feel the placenta, it is a case of placenta prævia. If you cannot reach the placenta by sweeping your finger round the lower uterine area, it is a case of accidental hæmorrhage. If you cannot get your finger in, you cannot be absolutely sure. A boggy, thickened feeling in one or other fornix will strongly point to placenta prævia, but this is not to be relied upon. Some men profess to be able to diagnose placenta prævia by abdominal palpation alone. Frankly speaking, I may say I have never been able to do so, and am afraid I never shall.

Prognosis.—It is a dangerous condition, especially for the child. The central variety is the most dangerous, the lateral less, and the marginal least. Of the 168 cases already referred to 37 died, giving a mortality of 22 per cent. This is a lower mortality than is given in many text-books. It includes cases treated between 1869 and 1898 inclusive. In the indoor department, between the years 1889 and 1898 inclusive, of the 45 cases treated 6 died, giving a mortality of a little over 13 per cent. This shows a considerable improvement, and it must be borne in mind that a large number of these cases come to the hospital after they have lost a great deal of blood. As a matter of fact some of them were moribund. Of 150 cases collected from the hospital records, going back for twenty-five years, and those I have had in private, 40 were complete and 110 partial—*i.e.*, lateral and marginal. Of the 40 complete, 7 died, equal to a percentage of 17½. Of the 110 partial, 13 died, or 11·8 per cent. The average over all was 13⅓ per cent. In looking more fully into the cases, however, it is seen that of the 50 treated from twenty-five to fifteen years ago 28 per cent. died, while the remaining 100 cases, which include my private ones, and were treated within recent years, give a percentage of 6. Even better results than this should be got, if you get the cases early, and treat them properly.

The prognosis for the child is very grave. In the series of 150 cases referred to there were 3 cases of twins, and of the 153 children 91 were born dead, while a good many of those born alive only survived a short time. Fully 60 per cent. of the children are usually lost at the time of labour, while some of them are too premature to live any length of time.

Treatment.—Palliative treatment should be tried when the hæmorrhage is slight, more especially if it is before the child is viable. You may be able to tide the patient over for a time until the child has sufficiently developed to be viable. Should the hæmorrhage recur, active treatment should be adopted in the interest of the mother. Remember that the mother's interest is paramount.

Palliative treatment consists in keeping the patient at absolute rest in bed, under an opiate, if necessary. The bowels should be gently moved, and the diet carefully regulated. Hæmostatic drugs, locally or internally, are of no use. In hospital, one has a chance of keeping the patient going for a little without much risk, as she is continually under observation, and, if the hæmorrhage recurs, measures can be taken at once.

With private patients you must impress upon their friends the importance of sending for you at once, if there is any bleeding. I know of one case where, in spite of the strictest warning, a patient was allowed to bleed for several hours before assistance was sent for. Her life was lost, as she was moribund when we reached her. Women are so accustomed to losing large quantities of blood at stated periods that they are not easily alarmed, so you must make it plain that you are to be called immediately if the bleeding recurs.

If the bleeding has recurred, or if the first attack is a severe one, active measures must be adopted. What we wish to accomplish is: (1) to check the hæmorrhage; (2) to dilate the cervix; (3) to deliver the child. We shall first consider cases where the cervix is not dilated. The best thing to do, then, is to plug the vagina thoroughly, pushing a little of the gauze into the cervix, if it will admit it. This must of course be done with aseptic precautions. Iodoform gauze or a kite-tailed plug may be used. The pressure exerted by the plug stops the bleeding, while at the same time uterine contractions are set up, and dilatation of the cervix caused. If the plug is properly inserted, there should be no bleeding. The patient must be watched. In six or eight hours the plug should be removed, and if the cervix is sufficiently dilated to admit two fingers, bipolar version should be done, if it is a vertex or transverse presentation, and a leg brought down. If the cervix is not dilated, insert another plug and wait. When the leg is once got down, the breech is gently drawn into the cervical canal, and it acts as the best possible plug and dilator. Wait until uterine action expels the breech. Massaging the uterus through the abdominal wall will assist this. Turning partially empties the uterus and allows of retraction taking place, so that the uterine arteries are partially closed and the bleeding lessened in that way. When the body is expelled, beware of delivering the head too quickly. If the cervix grasps the neck, wait. The child will probably be sacrificed, but at the best its chances are small, so that no risk to the mother should be run for the sake of a weakly, premature child. If you drag the head through and tear the cervix, you will probably lose the mother from uncontrollable hæmorrhage. A torn cervix is a dangerous complication in an ordinary labour, but with *placenta prævia* it is much more so. As soon as the child is born the uterus must be firmly kneaded. The placenta will usually be quickly expelled, but if it does not come away and there is bleeding going on, introduce your hand and remove it. A hypodermic injection of ergotin should be given at once. A hot douche is usually given, but its action in these cases is not so beneficial as in ordinary *post-partum* hæmorrhage. The placental sinuses are in the lower uterine segment, which at first lies more or less open in the top of the vagina until the cervix regains tone and contracts, and the stream of fluid may very easily wash the clots out of the mouths of the vessels. I have seen this occur more than once. If suprarenal extract is added to the douche the styptic action will obviate this risk. If the douche does not quickly check the bleeding, at once introduce your hand into the vagina, and firmly compress the uterus and cervix between it and the other hand over the abdomen. This can only be used as a temporary expedient. If you feel that the cervix is torn, it should be stitched in the way described on p. 410. If you cannot stitch it, or if it is not torn, the uterine cavity, cervix and vagina should be firmly plugged.

In cases where the bleeding is severe and the cervix dilated sufficiently to allow of bipolar version, do it at once without resorting to the vaginal plug. If you cannot manage to do bipolar, do podalic version, dilating the cervix by means of bags, or manually, until the hand will pass. Deliver with the precautions I have just indicated.

For artificial dilatation Barnes' or Champetier de Ribes' bags are very useful, and they may be used instead of the vaginal plug. Where the membranes have been ruptured, Champetier de Ribes' bag is very useful. I have used Frommer's eight-bladed dilator in several cases with good results. There was very little bleeding during the operation. If the vertex presents, forceps should be used, as turning will probably be no longer possible.

In cases where the cervix is fully dilated and the head presents, you may use forceps instead of turning.

Rupturing the membranes has been advocated, but it is not a good method, except in the marginal variety, when it may suffice, if the os is partially dilated. In such a case the bleeding will be checked by the presenting part being jammed down, but dilatation will be slow and subsequent podalic version rendered difficult or impossible, while bipolar version will be out of the question.

The treatment of the central variety does not differ from that of the others, except that in turning by the bipolar method the foot must be brought down through the centre of the placenta, and in doing podalic version the hand must be passed through the centre of the placenta, if it cannot be got round the edge of it.

Sir James Y. Simpson advocated stripping off the placenta completely. Barnes advocates stripping off the prævial portion. This tends to favour dilatation and checks the bleeding, but it lessens the child's chances. It is useful in some cases.

In any case, if the patient is very much collapsed, give her a saline injection before or after delivery, and stimulate her freely. In all cases be prepared to deal with post-partum hæmorrhage.

In recent years Cæsarian section, Porro's operation, or total extirpation of the uterus has been advocated. In this country the late Lawson Tait was the first to strongly advocate this method. He did a Porro and saved both mother and child. Tait was undoubtedly a brilliant operating surgeon, but the men who have to treat cases of placenta prævia are unfortunately not all Taits. In reporting his case, he stated that the death-rate from placenta prævia treated in the ordinary way was 50 per cent. If that was his experience, it was high time to adopt some other method.

In the American *Gynæcological and Obstetrical Journal* for October, 1901, E. Gustav Zinke, M.D., Professor of Obstetrics and Clinical Midwifery in the Medical College of Ohio, strongly advocates the proceeding, and in support of his opinions quotes all the cases which have been reported up to the present. Of the eight cases, six were subjected to Cæsarian section and two to Porro's operation. Of these five mothers were saved and six children. Of the three mothers lost, he maintains that two of them were hopeless when operated upon, and therefore should not be counted. Even allowing this, I fail to see that 17 per cent. can be favourably compared with what is the true death-rate—viz., about 5 per cent. I am perfectly willing to admit that more children will be saved by the operation, but this is the only thing that can be said in its favour. As the vast majority of the children are premature, their chances of surviving are at the best not very good, and for the sake of the child the mother should not be subjected to any extra risk. In the hands of brilliant operators like the late Lawson Tait the results would no doubt be good, but I do not think they would ever be as good as can be got by proper treatment in the ordinary way ; and it must be borne in mind that the men who have to treat these cases are not usually accustomed to doing abdominal sections. I have therefore no hesitation in condemning the operation.

CHAPTER XVIII

POST-PARTUM HÆMORRHAGE

Source of the Hæmorrhage—Causes of the Atonic Variety—Varieties—Primary and Secondary — Diagnosis — Prognosis — Treatment — How to give an Intra-uterine Douche—Method of Plugging the Uterus—Method of giving a Saline Injection—Traumatic Post-partum Hæmorrhage.

Hæmorrhages of the Puerperium—Secondary Post-partum Hæmorrhage: Cases —Hæmatoma—Deciduoma Malignum.

As the name implies, this form of hæmorrhage occurs after the birth of the child. The placenta may or may not have been expelled. When the placenta is still in the uterus it will usually be found to be partly adherent.

Source of the Hæmorrhage.—It is usually from the placental site, but occasionally from a lacerated cervix or vagina.

Nature's method of checking hæmorrhage after the child is born is by the contraction and retraction of the uterine muscle. If you place your hand on the abdomen in an ordinary case during or after the third stage, you will feel the uterus harden during a pain, but in a short time you will distinctly feel it soften under your hand when the pain has passed off. In an ordinary case practically no bleeding will occur during the relaxed condition. This is due to the retraction of the muscle-fibres closing the vessels, and also to the clotting in the mouths of them. In the great majority of cases the hæmorrhage is due to a want of contraction, and especially of retraction of the uterine muscular fibres. This may be known as the *atonic* form, while in those cases where it comes from a laceration it may be known as *traumatic*. In the latter form contraction and retraction will not check it.

Causes of the Atonic Variety.—1. The commonest cause of all is uterine inertia, which may arise (*a*) from the exhaustion of a too prolonged labour; (*b*) from previous overdistention by a multiple pregnancy, hydramnios, etc.; (*c*) from frequent pregnancies closely following each other; (*d*) from a weak state from serious constitutional disease; (*e*) from too rapid delivery.

2. Large placental site in cases of twins or triplets, and in such cases the overdistention is another factor.

3. Retention of clots or pieces of placenta or membranes.

4. Partially adherent placentæ.

5. Previous hæmorrhage in cases of placenta prævia or accidental hæmorrhage.

6. Hæmorrhagic diathesis, as from hæmophilia, purpura hæmorrhagica, anæmia, etc. Measles is said to predispose to this.

7. Diseases of the uterine walls, such as fibroids, etc.

Varieties—Primary and Secondary.—The primary occurs within an hour or so of delivery, while the secondary may occur any time later during the puerperium. The primary may be subdivided into external and concealed. The latter is rare.

Signs and Symptoms.—The patient's pulse becomes very quick and feeble, and she collapses and may faint. The uterus will be felt to be flabby, and there will usually be a great gush of blood from the vagina. In a few cases the external loss is trifling. The uterus will then be felt to be much larger than it should be. The patient shows all the signs of collapse. In any case shortly after or during the third stage of labour, if the pulse suddenly becomes very quick, at once examine to see if there is any indication of hæmorrhage externally or concealed.

Diagnosis.—A quickened pulse, indications of collapse, a flabby uterus, and, usually, a great gush of blood, make the diagnosis easy.

Prognosis.—It is a very grave condition, but with prompt and proper treatment the majority should be saved.

Treatment — Prophylactic. — If a patient has in former labours suffered from inertia uteri and hæmorrhage, for the last few weeks of pregnancy she should take small doses of ergot, strychnine, and iron. This will tone up the uterine muscle, and probably prevent post-partum hæmorrhage.

In no case should labour be allowed to drag on indefinitely until the uterine muscle is thoroughly worn out. Timely and proper use of the forceps is one of the best preventatives we have. If in the second stage the uterine pains are lessening, do not wait, but put on forceps. Always deliver slowly, and keep the uterus firmly pressed down against the body as it is expelled. Keep your hand on the uterus, and keep up gentle friction so as to stimulate its contractions. Never be in a hurry to express the placenta from the uterus unless there is a reason for doing so, but as soon as it slips into the vagina expel it. Forcible expression of the placenta immediately after the child is born is bad practice. This is not Nature's method. After the placenta is expelled, the hand should be kept on the uterus for some minutes until it is firmly retracted. If the third stage is properly conducted, post-partum hæmorrhage can be largely prevented.

In cases where the hæmorrhage comes on before the placenta is expelled, try at once to express it by Crédé's method after firmly kneading the uterus. If you cannot manage this, do not wait, but introduce your hand and remove the placenta and clots. Peel the placenta off, if it is adherent, and make sure you get it and the membranes completely away. Knead the uterus down firmly on your closed hand, retained in the cavity, or compress the uterus firmly between one hand in the vagina and the other over the abdomen. This latter method is especially useful in cases following placenta prævia, as it firmly compresses the lower uterine segment, from which the bleeding is coming. The abdominal wall is usually relaxed sufficiently to allow you to grasp the uterus, by passing your hand down behind it. If you can do this, bend the body acutely forwards and push it well downwards. At the same time you can compress the aorta at its bifurcation with the back of your wrist. A hot intra-uterine douche (120° F.) should then be given, and ergotin hypodermically. Ergot by the mouth does not act quickly enough, but it is of use for keeping up the contractions later on. Active compression and friction must be kept up all the time until the uterus gets firmly retracted. After an hour or so a firm binder may be put on with pads, but, if there is any indication of relaxation, do not trust to anything except your hand.

Injections of cold water were formerly used, or pieces of ice placed in the uterus. The hot water is much better, but it must be used at 120° F.—that is, just as hot as you can bear your hand in. It is comforting to the patient, and does not cause any shock as cold would be apt to do.

How to give an Intra-uterine Douche.—A continuous flow should be used; not an intermittent one, as from a Higginson's syringe. There are various forms of douche cans—metal, glass, and rubber. In hospital a large glass one, which will hold 1 or 2 gallons, is the most useful. The handiest form I find, for private work, is a rubber bag, one with a valve at the top. When full, it can be allowed to lie on its side without any fluid running out. It holds 5 pints, or 100 ounces, so that 1 ounce of lysol or creolin added makes a 1 per cent. solution. The best form of nozzle to use is a long, curved, grooved glass one (Fig. 22). It gives a good flow, and insures the return of the fluid. This form can very easily be introduced into the uterine cavity without passing the fingers into the vagina. This is of importance, as the risk of carrying in septic material is thus lessened. Bozeman's double nozzle does not give nearly so good a flow, and it cannot be used with corrosive sublimate without blackening it. I strongly recommend the glass one. It is very cheap, can be made absolutely sterile by boiling, there are no joints, etc., in it to conceal dirt. It is not easily broken. If a short piece of rubber tubing is attached to the nozzle, it can be boiled along with it before using, so that the part which is grasped is aseptic.

There are two positions in which a patient can be douched—on her left side or on her back. The latter is by far the better. Her hips should be well over the edge of the bed, so that the fluid will run off the mackintosh into a bath. If you have no assistance, you can place two chairs for her to rest her feet on their backs; or, if she has stockings on, get her to grasp the top of each, and hold the legs up herself. This gives her something to do, and will keep her attention away from what you are doing. The external parts should first be cleansed, and then the vagina douched out, before the nozzle is passed on into the uterus. Always use plenty of fluid. If you are using corrosive sublimate, end up with boiled water, to wash out as much of the albuminate of mercury as possible. Immediately after labour, when a douche is necessary, there is nothing better than boiled water, provided the labour has been conducted on aseptic principles. An intra-uterine douche must be looked upon in the light of an operation, which must be done with the utmost care. A nurse should never be allowed to give it.

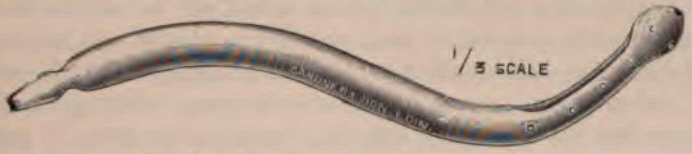

FIG. 22.—INTRA-UTERINE GLASS NOZZLE.

To return to the consideration of hæmorrhage. If it should continue in spite of douching, etc., there are two other methods which may be adopted—viz., the injection of a styptic and plugging. The use of perchloride of iron as a styptic was strongly advocated by Barnes. He recommended the injection of a few ounces of liq. ferri perchlor. (B.P.) into the uterine cavity after clearing all the clots out. The strong liquor may be used by adding enough to water to make a sherry-coloured fluid. Besides its astringent action, it irritates the uterine muscle and causes contractions. There is no doubt of its powerful hæmostatic action, but it has the great drawback that it causes a certain amount of superficial necrosis, and this necrosed tissue has to separate and come away. Necrosed tissue lying in the uterus is always a source of danger to a woman, and markedly so to one who has had a severe hæmorrhage. The danger of septic absorption after hæmorrhage is very great. If iron is used, the uterus should be thoroughly douched out next day. Fortunately we now possess a drug which has quite as powerful a hæmostatic action as iron, and it has the great advantage of not causing necrosis of the tissues. I mean suprarenal extract. I have used it in the tabloid form. A drachm of the crushed tabloids is boiled for three minutes, and sufficient sterilized water added to form 2 pints. The uterus is then douched out with this. The liquid preparations could be used in the same way, and, as they are sterile, boiling would not be necessary. I do not recommend the use of iron, and if you should not have suprarenal extract at hand, or if it should fail, plugging should be resorted to. The plug can be wrung out of suprarenal solution. Iodoform gauze makes the best plug, but lint, bandages, or strips of rag may be used, provided the material is aseptic. This can be insured by boiling. A speculum, forceps to grasp and steady the cervix, and a pair of uterine forceps, facilitate the plugging ; but if they are not at hand you can do without them, only you must have something with which to pack the material into the uterus. The douche nozzle, long silver catheter, or a sound will do. Long strips of the material must be pushed right up to the fundus until the cavity is packed. Always leave the end of the strip in the vagina. After the uterine cavity is full, plug the vagina firmly, then put on a firm binder. The plug should be removed in twelve hours or so, and the uterus thoroughly washed out with an antiseptic. The mouths of the vessels will be sealed up by that time. Writing of plugging reminds me of a case of central placenta prævia which was sent into the hospital plugged with some of the clothing which had been prepared for the baby. Shortly after the patient was admitted she expelled first baby-clothes, then the placenta, and finally the child, which was of course dead ; therefore the clothes which had been brought in this novel way were not required. She recovered. The clothes were the cleanest things the doctor could lay his hands on for plugging with. The three following cases may be taken as illustrative. The first case was one of post-partum hæmorrhage after accidental hæmorrhage. In spite of a copious hot douche, ergotin hypodermically, and friction over the uterus, there was considerable oozing. I plugged the cavity of the uterus and the vagina firmly with aseptic lint, and on removing it twelve hours later there was no bleeding. She made an uninterrupted recovery. The second case was one of post-partum hæmorrhage after a very difficult delivery through a contracted pelvis. She was pulseless, and required an injection of 3 pints of saline fluid, but the plug completely checked the hæmorrhage. In the third case, after accidental hæmorrhage, it did not do so well, as I had not sufficient material to fill the uterine cavity completely. There was considerable loss a few hours later, and a saline injection had to be resorted to. The plugging failed, because it had not been done thoroughly. The patient, however, made a good recovery.

If the patient has lost much blood she will be in a collapsed condition, and this must be seen to at once. When much blood is suddenly lost from any cause, the vessels do not have time to contract to accommodate themselves to the new conditions of things, and the remaining blood tends to stagnate, as it were, in the large dependent veins. It is not properly returned to the heart, and the brain suffers from anæmia. The heart becomes affected, because it has not sufficient fluid to contract on. We have then to stimulate the heart, get as much blood sent to the brain as possible, and increase the volume of fluid in the vessels.

To stimulate the heart, hypodermic injections of strychnine, ether, or brandy should be given, and hot fomentations applied over the pericardium. A rectal injection of whisky and water, 2 ounces of each, is very useful. It seems to cause uterine contractions, and is thus useful in two ways. The anæmia of the brain can be relieved by lowering the patient's head and raising the foot of the bed. Bandaging the legs and arms is also useful. If the patient can retain fluids she should be given stimulant by the mouth frequently. Copious warm drinks of tea, milk, beef-tea, etc., are all useful. Her warmth should be kept up by means of hot-water bottles.

The best method of increasing the amount of fluid in the vessels is by the injection of a saline solution (1 drachm of common salt to 1 pint of sterilized water at the temperature of 100° F.). This may be done into the rectum, under the skin into the cellular tissues, or directly into a vein. The rectal injection is the simplest and easiest, and is very useful, if the case is not very urgent. The absorption is slow, and often the rectum will not retain the fluid. Transfusion directly into a vein is not always easy to perform, but the intercellular injection is so easily and quickly done that none need hesitate to try it.

Method of giving a Saline Injection.—The apparatus made for me by Messrs. Gardner and Sons consists of an aspirator trocar and cannula, several feet of rubber tubing, and a 2-ounce filler fitted in a metal box. The whole can be sterilized by boiling. The injection can be made into any part of the body where the tissues are lax. Under the edge of the breast or into the abdominal wall is a suitable place. The skin should be rendered aseptic. Expel all air from the apparatus by running some fluid through the cannula before pushing the trocar home in its cannula. When the puncture is made, withdraw the trocar, and raise the filler several feet. If the fluid does not flow freely, move the cannula about a little to clear its point. A pint can be injected in four or five minutes. If the tissues are at all lax, 2 or even 3 pints can be used. If more is required another puncture can be made. A strip of adhesive plaster should be placed over the small wound. Absorption begins at once, and the tension in the part will be quickly relieved. When injected into the axilla, there will be some pain and numbness in the arm from pressure on

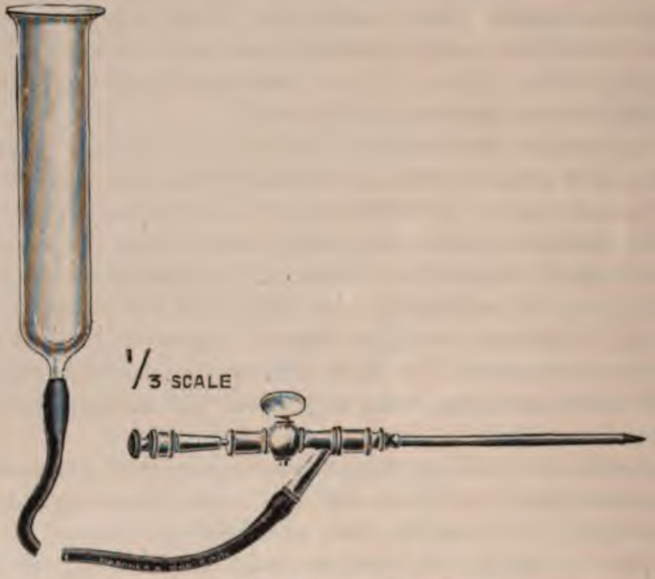

FIG. 23.—SALINE INFUSION APPARATUS.

the nerves, but this is quickly relieved. If strict aseptic precautions are taken, there is no risk of an abscess forming.

The after-treatment of a bad case of hæmorrhage consists in giving the patient plenty of fluid and stimulating nourishment. She should get plenty of milk, soups, beef extract, or beef-tea, etc. Alcoholic stimulants should be given so long as the pulse indicates its necessity. For drugs, iron alone, or combined with arsenic or quinine, is the best. As these cases are very prone to become septic, the greatest care must be taken to prevent this, and, if it occurs, you must lose no time in adopting active measures of treatment.

Traumatic Post-partum Hæmorrhage.—In these cases the hæmorrhage comes from a laceration of the cervix, vagina, perineum, or vulva. These lacerations usually occur during difficult labours, but it is possible to have very extensive tears in natural deliveries. The worst bilateral laceration of the cervix I have ever seen occurred in a primiparous natural labour. Fortunately the bleeding was not very severe. I had to put five or six stitches in each side of the cervix to close the tears. The cervix is sometimes torn in forceps delivery, and this is apt to occur if the instruments are applied before the os is fully dilated. They should never be applied before full dilatation of the os, unless delivery is urgently required in the interest of the mother. Delivery should then be effected slowly and with the utmost care. Delivery of the after-coming head, especially in cases of placenta prævia or of accidental hæmorrhage, is apt to tear the cervix, unless great care is taken. I have already referred to two cases of this, and Fig. 24 is a drawing made from the uterus from one of them, a case of placenta prævia, where you will see the tear extending up at the side into the body of the uterus. The after-coming head was dragged through the undilated cervix, and you see what happened.

Lacerations of the posterior vaginal wall and perineum usually go together. You hear the forceps frequently blamed for this. The worst tears I have seen have been in cases where forceps were not used at all. I frequently use the forceps to save the perineum. There are cases where laceration of the perineum cannot be avoided, but if the axis-traction forceps are used carefully, and the delivery effected slowly, in the majority of cases, if there be any tearing, it will only be slight.

As a rule the hæmorrhage from vaginal or perineal tears is not alarming.

I have seen considerable hæmorrhage from a small tear in the vestibule from one of the venous plexuses having been injured.

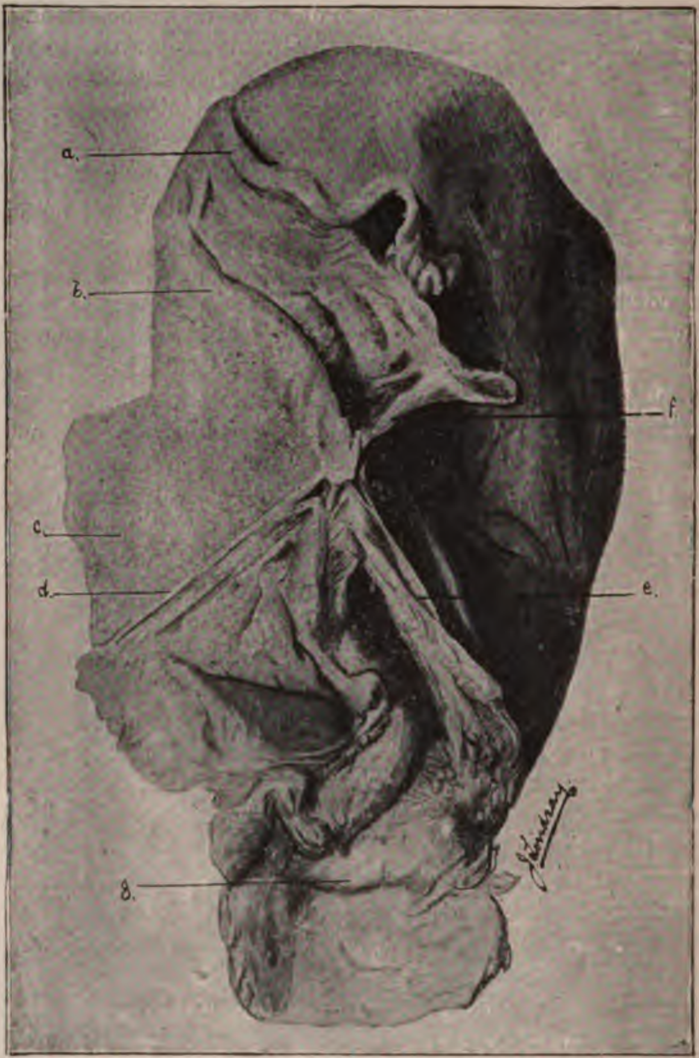

FIG. 24.—RUPTURE OF THE CERVIX AND LOWER UTERINE SEGMENT.

a, Fallopian tube; *b*, round ligament; *c*, posterior wall of bladder; *d*, anterior layer of broad ligament; *e*, posterior layer of broad ligament; *f*, united layers of broad ligament; *g*, os externum.

Diagnosis of Traumatic Post-partum Hæmorrhage.—There will be external bleeding going on although the uterus is firmly retracted. A vaginal examination will reveal a tear in the cervix, vagina, perineum, or vulva.

Prognosis.—It is grave when the cervix is badly torn, and specially so if it has been a case of placenta prævia.

Treatment.—The prophylactic treatment is to deliver slowly and with great care. In a case of placenta prævia, do not deliver until the os is sufficiently dilated to allow of the head passing easily. If the hot douche fails to check the hæmorrhage from the cervix, you must stitch it. In fact, if there is much laceration, even if there is no hæmorrhage, you should stitch. The cervix can easily be drawn down to the vulva to enable you to put the stitches in. If you see any spouting vessels tie them. If you have not the means at hand for stitching, you must then trust to plugging, but this is not as efficient. In a tear like that in Fig. 24, stitching of the vaginal portion of the cervix will not do. The only hope of saving the woman is to open into the lateral fornix and tie the uterine artery, and if that does not suffice, extirpate the uterus completely.

The following case may be taken as an example : The patient, a multipara with a true conjugate of 3¼ inches, had induction of labour performed at seven and a half months. The cervix was very rigid from old cicatricial contraction from tears in former difficult labours. After delivery hæmorrhage continued in spite of a hot douche, and ergot hypodermically. The bleeding came from a tear in the left side of the cervix. I at once drew the cervix down and put six catgut stitches into it. This completely controlled the hæmorrhage. I have again successfully delivered this woman by induction. The cervix did not tear the second time.

If there is a tear in the vaginal wall, stitch it after tying any bleeding points you see. A continuous suture does admirably. I need hardly say that a torn perineum, whether it is bleeding or not, should always be stitched at once. A tear in the vestibule must be treated in the same way. It is very easy to conceal the fact that the perineum is torn, but remember that the woman will become painfully aware that something is wrong after she gets up, and she will not bless the man who has left her in such a condition. I have heard men assert that they never see a torn perineum. I believe them, because they never examine their patients after the child is born. It is no disgrace to tear a perineum, but it is a disgrace not to stitch it when it is torn. In every case, even in normal labours, examine the perineum after the child is born, and if it is torn ½ inch or more, stitch it. The deep stitches should include the whole tear. Silkworm gut makes the best deep stitches, but catgut, which will not be absorbed for six or eight days, does exceedingly well, and has the advantage of not requiring removal.

If the patient is at all collapsed, the same methods of stimulation, saline injections, etc., as are used in the atonic form of hæmorrhage, must be adopted.

HÆMORRHAGES OF THE PUERPERIUM.

Secondary Post-partum Hæmorrhage.—Secondary post-partum hæmorrhage may occur any time during the puerperium.

Cause.—In nearly every case it is due to something retained in the uterus, such as a piece of placenta or membrane, a clot, or a small polypus. Separation of a clot from the mouth of a torn sinus may cause it, especially after placenta prævia. In a good many cases there has been primary post-partum hæmorrhage.

The amount of blood lost at one time may not be excessive, but if it recurs frequently the drain upon the system may be very great, and pernicious anæmia may result.

The signs and symptoms are the same as those of the primary form. It is apt to recur unless the cause of it is removed.

Prognosis.—If the amount lost is great it is a grave condition, especially if there has been ante-partum or primary post-partum hæmorrhage.

Treatment.—The best prophylactic treatment is to thoroughly empty the uterus at the time of labour, and see that it is firmly retracted before the binder is put on. If there is any indication of relaxation, ergot should be given. When it has occurred, a hot douche and ergot may check it, and cause the expulsion of whatever is retained, but this cannot be relied upon. You should thoroughly explore the uterus with your finger, and remove whatever you find. If you cannot clear it out with your finger, use the flushing curette. To do this thoroughly chloroform will generally be necessary. If the hot douche does not check the hæmorrhage, plug the uterine cavity thoroughly. Put the patient upon ergot and strychnine. Do not delay in clearing out the uterus, as repeated hæmorrhages will quickly exhaust your patient. If the woman is septic at the time, there is considerable risk of further absorption taking place through the freshly opened up surfaces. You must therefore use every precaution. The uterus should be thoroughly douched out with an antiseptic before attempting to remove anything.

The after-treatment is the same as after primary hæmorrhage.

The following three cases may be taken as types: The first was a multipara, seen by me in consultation three weeks after delivery. Her own medical attendant had not been present at the labour, but the man who attended said that everything had come away. She had severe hæmorrhages several times during the puerperium. Hot douching and ergot did not stop them. Her temperature had not been very high. Under chloroform I found there was a piece of placenta about the size of a walnut firmly attached. I removed this with a flushing curette and thoroughly douched out the uterus, but had to plug with iodoform gauze to stop the hæmorrhage. The repeated hæmorrhages had weakened her down very much. Every care was taken at the time and subsequently, but violent sepsis resulted, and she died a few days later. We tried antistreptococcic serum, but without any lasting benefit.

The second case, a primipara, was admitted to the Glasgow Maternity Hospital four days after delivery. She had been attended by a midwife, who thought everything had come away. Profuse secondary post-partum hæmorrhage had occurred on the third day of the puerperium. On admission we found the patient was very anæmic, She had great œdema of the legs and body, and there was evidence of ascites. The urine was loaded with albumin. Her temperature was raised, and pulse quick and feeble. It was quite evident that she was suffering from sepsis. After douching and cleansing the parts as thoroughly as possible, I introduced my hand and removed an adherent piece of stinking placenta. As I anticipated, the operation was followed by a rise of temperature. It fell, but rose again in a day or two. As the case was one of septicæmia, we had to send her out of the hospital, but her friends refused to allow her to be transferred to Belvidere, so she was taken home, where she died. Both of these cases had evidently had succenturiate placentæ, and a detached lobe had been left in the uterus. It is easy to blame the attendants, but it is very difficult to recognise this condition of the placenta, unless a very close examination is made. Fortunately, it is a rare condition.

In the third case, the patient was a multipara, attended by a nurse. The labour and puerperium were normal, and the patient was up by the tenth day. Early on the morning of the eleventh day she had a violent flooding, and I was sent for. I found her very much exhausted, and on examining found the vagina and uterus full of clot. I cleared all the clot out, and gave a very hot douche. I found nothing in the uterus except clot. She was put on ergot and nux vomica. There was no recurrence, and she made a good recovery.

Hæmatoma.—Hæmorrhage into the pelvic tissues may take place during pregnancy, as we have already seen. It may also occur at the time of labour, or very shortly after the child is born. In such a case the vessel is torn during the labour, but the condition is not recognised until sufficient blood is poured out to form a swelling. The veins in the broad ligaments, vagina, and vulva are frequently very much distended or varicose at the time of labour, and an injury to any of them is apt to cause considerable hæmorrhage. Judging from Cæsarian sections, the varicosity of the veins in the broad ligaments is an exceedingly common condition. In all my cases this condition has been marked.

When a vessel deep in the tissues is opened into, blood will be poured out. The amount will of course depend upon the size of the vessel, and also upon the laxity of the tissues. The blood makes its way towards the most dependent part, and if it comes near the surface you have the skin becoming black. If the hæmorrhage is very great the patient may collapse, but, as a rule, the pressure of the surrounding tissues will check it before this happens.

A hæmatoma of the vulva may form during the latter end of pregnancy or at the commencement of labour. If it has not had time to become absorbed, it may obstruct the labour (see case, p. 225).

Signs and Symptoms.—Unless the hæmorrhage is very great there will not be any indications of collapse. The patient usually complains of a bearing-down feeling, as if there were something to come away from her.

Diagnosis.—A vaginal examination will reveal a somewhat fluctuating swelling in the pelvis. If it is in the broad ligament, it will be to one or other side of the uterus, but it will frequently be felt in the side or back wall of the vagina. In many cases in a few hours you will see the black discoloration of the skin of the buttock.

Prognosis.—It is not likely to prove fatal, unless it becomes septic, and even then prompt evacuation of the clot and free drainage should save the patient's life. In some cases, when in the broad ligament, it might burst into the peritoneal cavity and cause her death.

Treatment.—Stimulate the patient if she requires it, and try to get the effusion absorbed as quickly as possible. Try to prevent her becoming septic. If the clot becomes septic, her temperature will rise and rigors come on. It must be at once freely incised and cleared out. The cavity should be plugged with iodoform gauze. Sometimes the skin or mucous membrane covering it shows indications of sloughing. In such a case a free incision should be made at once. In a case of hæmatoma of the vulva which is obstructing labour it should be freely incised, and, after delivery, stitched up with a continuous catgut suture. The stitching will control the bleeding, and if it is done with aseptic precautions the parts should heal by first intention.

The following is a typical case. The patient, a multipara, was delivered of a child by the breech in the afternoon. The midwife, in her endeavours to get the child through alive, tore the perineum badly. Several hours later I was sent for, as the woman was very weak and complained of great bearing-down, as if there were something to come away. From the history I thought it might be an inversion of the uterus. I found the uterus was in position, but the right side of the vagina was bulged inwards by a large semifluctuant tumour, which I diagnosed to be a hæmatoma. I gave her a thorough douching and stitched the perineum. Next day the right side of the vulva and the right buttock were quite black.

The clot remained aseptic, and in about three weeks it was nearly absorbed.

DECIDUOMA MALIGNUM—SYNCYTIOMA—CHORIO-EPITHELIOMA—DECIDUO-SARCOMA, ETC.

Sänger, in 1888, was the first to draw special attention to this disease as a sarcoma of the decidua serotina. In 1893 he demonstrated its essential histological features and pronounced malignancy. Since then a large number of cases have been observed, about 50 per cent. of them following vesicular degeneration of the chorion.

The pathology of the condition is hardly yet definitely settled. Sänger's original theory was that it was a malignant change occurring in the decidual cells—*i.e.*, a maternal sarcoma entirely due to pregnancy. Another view is that it is a sarcoma independent of, but modified by, pregnancy, and a third that it is the result of active proliferation of the epithelial covering of the chorionic villi—*i.e.*, that it is of the nature of an epithelioma, hence the name chorio-epithelioma. Whatever may be ultimately decided to be the true pathology, it is quite certain that the condition is an exceedingly malignant one, sometimes arising in the uterus after a full-time labour, more frequently after an abortion, and especially after the discharge of a mole. It gives rise to excessive and repeated hæmorrhages, and metastatic deposits soon form in the vagina and different organs, such as the lungs, brain, etc. The patient very rapidly wastes away, and probably dies within a few months of the first indication of the disease.

Symptoms.—The most characteristic symptom is severe, intermittent hæmorrhage following labour or an abortion, especially of a hydatid mole. After the hæmorrhage ceases a foul-smelling watery discharge, the same as with an ordinary cancer of the uterus, will come on. The patient may not suffer very much pain, except when clots are being expelled. Emaciation soon shows itself, and when metastatic deposits form in the lungs there will be cough, pleuritic pain, breathlessness, and blood-stained sputum. A secondary deposit in the brain will cause cerebral symptoms, and, it may be, severe hæmorrhage, as in a case reported by Drs. Bruce and Inglis.

Diagnosis.—The uterus is found more or less enlarged. The vagina may be full of clot, and a secondary growth may be attached to its wall. The cervix is generally found gaping, but it may be quite closed. Bimanually the uterus is found enlarged, and you may make out a distinct growth. A digital exploration of the cavity reveals clots and soft vegetating masses. The uterine wall is soft, and may be easily perforated. A portion of the mass can easily be removed by the finger or curette for microscopic examination.

Prognosis.—The condition is an exceedingly grave one, and the only hope of cure is immediate extirpation of the uterus. If metastasis has already occurred, however, the advisability of the operation is very questionable.

Treatment.—Complete hysterectomy, preferably by the vagina. A preliminary curetting may be done to check the hæmorrhage and for diagnostic purposes, but from a curative point of view it is useless.

CHAPTER XIX

DELAY IN THE FIRST STAGE OF LABOUR

Dilatation of the Birth Canal—Delay from faults in the Powers—Inertia Uteri—Delay from Faults in the Passages—Occlusion of the Os Uteri: Cases—Malposition of the Uterus—Vaginal Fixation of the Uterus—Rigidity of the Cervix—Rigidity from an Abnormal Condition of the Cervix—Hypertrophy of the Cervix—Malignant Disease of the Cervix—Contracted Pelvis—Faults on the Part of the Passenger—Early Rupture of the Membranes—Adhesion of the Membranes—Malpositions, etc.

In taking up the consideration of delayed labours and their treatment, we shall first consider delays in the first stage.

Dilatation of the Birth Canal.—The birth canal consists of the lower uterine segment, the cervix, and the vagina. Dilatation begins a considerable time before actual labour sets in. During the last two or three weeks of pregnancy the cervix shortens, and its canal dilates, from above, so that it becomes continuous with the lower part of the uterine cavity. The lower part of the uterine cavity also dilates. The shortening or taking up of the cervix is well seen in primiparæ. In these cases the head of the child at the beginning of labour will be more or less in the pelvis, with the thinned cervix stretched over it. The apparent length of the cervix, measuring from the external os to the bag of membranes, may not be more than ¼ inch. The external os is usually closed until actual labour sets in, but this is not always the case even with primiparæ. In multiparæ I have frequently seen it for weeks before delivery dilated sufficiently to allow of the passage of two fingers. What may be called painless labour goes on for some time prior to what we know as actual labour, and in this way the lower uterine segment and the upper part of the cervix are dilated.

When labour sets in, the natural dilatation of the cervix is mainly brought about by the downward pressure of the uterine contents, caused by the uterine contractions, and especially by the contractions of the longitudinal fibres which pass up over the fundus. These fibres also tend to draw the lips of the cervix apart, and to pull the lower part of the canal up over the presenting part. As a rule, the circular fibres round the external os become inhibited, but, as we shall shortly see, this does not always happen. Gravity also assists, especially when the patient is going about. Over and above this we have a natural softening and relaxing of the parts, especially in the vagina. At the beginning of labour the vaginal outlet may be quite narrow, especially in primiparæ, but long before the presenting part has reached the floor of the pelvis great relaxation will have occurred, so that several fingers can be introduced with ease, causing less discomfort to the patient than one did at the onset of labour. This relaxation is due in part to the free flow of serum which takes place, but there must also be inhibition of the sphincter muscle, probably from the pressure exerted higher up in the canal.

During the first stage of labour, dilatation of the cervix should progress steadily until it is fully accomplished, but in many cases there is considerable delay. The cause of the delay may lie in **the powers, the passages,** or **the passenger.**

Delay from Faults in the Powers—Inertia Uteri.—The powers are the uterine contractions, and there is also some assistance from the action of gravity. The powers are not so often at fault during the first stage of labour as during the second. If the uterus is overdistended by a multiple pregnancy or hydramnios, the contractions will be weak. An abdominal tumour or ascites will also interfere with the contractions, as will a loaded rectum or distended bladder (see Fig. 10, p. 123). A tumour, loaded rectum, or distended bladder will also interfere by direct obstruction. True inertia is not very common, but is sometimes seen in elderly primiparæ, and in multiparæ who have borne a large number of children. In some cases the contractions cause a good deal of suffering, but have little dilating effect.

Treatment.—So long as the membranes are intact there is no risk to the fœtus, and very little to the mother, except from exhaustion, so that patience is usually all that is required. In cases of overdistention, puncture the membranes and allow some of the liquor amnii to drain away. In all cases see that the bladder and rectum are emptied. The treatment in cases of tumours will be dealt with later. In cases of true inertia, I have sometimes found quinine act well. Ergot should never be given. Chloral is, however, the best drug to use. It quiets uterine action for a time, and has a relaxing effect upon the cervix. The application of hot stupes over the abdomen is also useful. With painful contractions 10-grain doses of antipyrin are said to act admirably, but I have not had any experience of this.

Delay from Faults in the Passage—Occlusion of the Os Uteri.—The os may be completely occluded. This is a rare condition, but I have seen at least five cases. A short note of two of them will suffice.

Case I.—This was in a second pregnancy. It was also undoubtedly a case of prolonged gestation, as 305 days had elapsed from the cessation of menstruation until the patient was delivered. Some three weeks before delivery pains had occurred for several hours, and the patient thought that labour had commenced, but the pains had ceased. She was not examined then. When I saw her she was having strong pains, and, on an examination, I found the os was completely occluded. The cervix was stretched over the presenting head. A small depression indicated where the os ought to have been. A careful examination under chloroform confirmed this. A crucial incision was made at the depression, and dilatation was easily accomplished. Forceps were applied, and the head delivered without very much difficulty, but the shoulders and chest of the child were so large that great difficulty was experienced in delivering the body. The child was one of the largest I have ever seen delivered. Unfortunately it was dead. The patient made a good recovery, and subsequently the cervix presented the appearance of an ordinary multiparous one.

Case II.—The patient, a primipara, aged thirty, had been in labour three days when first seen by me. A midwife, who was in attendance, thought that the os was partially dilated. The patient was a stout, healthy woman, and had been married for thirteen years. She was not aware of there having been a vaginal discharge during pregnancy, nor had she suffered any pain.

I found she was having very strong expulsive pains. Bandl's ring could not be palpated. *Per vaginam* the head was felt in the pelvis with the cervix stretched over it. The os was completely closed, but a small depression revealed its position. Inspection under chloroform confirmed this. The surroundings of the patient were very insanitary, but as she refused to go to hospital, I had to do the best I could for her where she was. I managed to tear through the adhesions with my finger-nail. Dilatation was easy, and there was no difficulty in delivering a live child with forceps. As in the other case, there was no bleeding. The patient made an excellent recovery.

I examined her some months later, and found the cervix showed very little indication that she had ever had a child.

The occlusion must, of course, occur subsequent to impregnation, but at what stage of the pregnancy it is difficult to state. It is probably the result of adhesive inflammation. In one of my other cases the membranes were very adherent in the lower pole of the uterus, pointing to the fact that there had been an inflammatory attack. In none of my cases have I been able to get a history of any inflammation.

Diagnosis.—A careful examination will reveal that the presenting part is covered by a smooth membrane which is continuous all round with the vaginal mucous membrane. No os can be found. A careful search must be made for the os, because occasionally it is very high up and behind, and the thinned anterior lip of the cervix, which is stretched over the presenting part, gives exactly the same appearance as with occlusion.

Prognosis.—There is no risk if the condition is recognised and properly treated, but if it were neglected rupture of the uterus might occur, or, what is more probable, the whole cervix be torn off in front of the presenting part.

Treatment.—Scratch through where the os should be, or make a crucial incision. You may then wait and allow natural efforts to finish the labour, but I prefer to dilate and deliver at once. In one case in which it was left to nature after incision, I found tearing taking place into the lateral fornices, so I freely incised the cervix in front and behind, and then delivered. There is not usually much bleeding, but if there should be, the cervix ought to be stitched at once. In none of my cases did I find this necessary.

In some cases we have delay from the anterior part of the cervix being stretched over the presenting part, and the os thus being thrown high up near the promontory. As I have already mentioned, this may be mistaken for an occlusion of the os.

Treatment.—Hook a finger into the os and draw it down, so that the bag of membranes and presenting part may bear directly upon it.

Malposition of the Uterus, such as is seen when the abdomen is pendulous, will cause delay, as the presenting part is not driven downwards. A lateral deviation of the uterus will also cause delay, and we see the same thing with a double uterus. In the latter we also have delay from want of power in the uterine contractions.

Treatment.—Correct the deviation of the uterus and apply a firm binder. Manual dilatation may be necessary.

Vaginal Fixation of the Uterus.—In subjects of this operation dilatation of the os may be seriously interfered with, or even prevented. During pregnancy the firm union between the vagina and anterior uterine wall may prevent the growth of the latter. In this case the tension upon the posterior uterine wall draws the os upwards and backwards, so that at full time it lies above the promontory. The uterus is thus extremely anteflexed, and during labour the presenting part is driven against the promontory, and not into the brim.

Treatment.—If dilatation, by means of bags or the hand, is impossible, Cæsarian section should at once be performed. The incision may be made through the anterior vaginal wall and uterus, but the ordinary abdominal route is preferable. In the latter, the uterine incision should be either transverse at the fundus, or longitudinal, over the fundus into the posterior wall. The patient should be sterilized.

Rigidity of the Cervix.—This may be simple or due to disease. The best example of the simple form is seen in elderly primiparæ. The cervix is thick and dilates very slowly. With premature labours we find much the same condition. In such a case a few doses of chloral will be very useful, but patience is usually all that is required. We sometimes meet with a case in which the external os is small, and the cervix very thin. Although the pains may be strong, dilatation is very slow. In such cases you will often find that the os actually becomes contracted during the pains. The circular fibres round the os at the beginning of labour should be inhibited, but in these cases this has not occurred; their activity remains, and they contract spasmodically with the other muscular fibres of the uterus. This condition is usually seen in primiparæ, and especially where there has been a very narrow os previous to impregnation—the so-called pinhole os.

Treatment.—The best method of dealing with the condition is to dilate manually under chloroform. The anæsthetic will relax the spasm of the sphincter, and after dilatation is once fairly started there will be no further difficulty. The direct application of cocaine has been highly recommended in cases of rigidity of the cervix, but I cannot say it has ever proved useful in my hands. The hot douche certainly does good, and I employ it in all cases during the time I am dilating manually.

Rigidity from an Abnormal Condition of the Cervix.—The cervix is sometimes thick and hard from old scars, from the result of an old inflammation, or from the application of strong caustics in the treatment of endocervicitis. The tissues are very hard, and dilatation is therefore slow and difficult.

Treatment.—Barnes' bags may have to be used, and manual dilatation under chloroform. In some cases incision may be necessary. Four incisions should be made—two lateral, one anterior, and another posterior.

Hypertrophy of the Cervix is sometimes seen.—The vaginal portion may be so elongated as to protrude at the vulva. It may be associated with prolapse of the uterus, as in the following case: A multipara had been in labour for a considerable time when I first saw her. The cervix was so much elongated that it protruded at the vulva. The whole uterus also tended to prolapse. The cervix was not quite fully dilated. Under chloroform I dilated it as fully as possible, and applied forceps. When traction was applied, the whole uterus tended to come down, so that it was necessary to push up the cervix while making traction, and in this way it was gradually pushed up over the head.

Treatment.—As the membranes are sure to rupture early, artificial dilatation is necessary. Bags may be used, but manual dilatation under chloroform is the best method. Delivery must be done very slowly.

Malignant Disease of the Cervix.—If the cervix is much infiltrated with cancer, dilatation will be very slow. If the tissues are friable, there may be considerable bleeding, but dilatation will not be hindered. Occasionally the mass is so large that delivery through the natural passages will be impossible.

Treatment.—If there is likely to be much difficulty, and the child is alive, Cæsarian section should be done, in the interest of the child, and a complete extirpation of the uterus, in the interest of the mother. Even with a dead child Cæsarian section and removal of the uterus may be necessary (see case, p. 515). If you decide to deliver through the natural passages, the cervix should be incised through the diseased portion and dilated manually. If the child is dead, do craniotomy, and if it is alive and the head presents, deliver by forceps. The cancerous portion of the cervix may be removed at once, or you may delay operating until involution has somewhat advanced.

Solid non-malignant tumours or cysts may delay dilatation, or even prevent it entirely, especially if they are wedged into the pelvis.

The treatment of such cases will be dealt with when treating of labours obstructed by tumours. One point to remember is to try to prevent early rupture of the membranes.

A Contracted Pelvis will cause Slow Dilatation.—Malpresentations and malpositions are common, and the bag of membranes often protrudes in a sausage shape and ruptures early.

Treatment.—If the membranes have not ruptured, keep them intact as long as possible. If they have ruptured, and the presenting part cannot descend, artificial means of dilatation should be adopted. The dilating bags are most useful, but manual dilatation will frequently be necessary.

Faults on the Part of the Passenger.—Excessive amount of liquor amnii, or overdistention from plural pregnancy, has already been referred to as causing delay by interfering with the powers. On the other hand, we may have delay from the very opposite condition—viz., a small amount of liquor amnii. In such a case there is no bag of membranes to come down into the os, as the membranes are closely applied to the presenting parts. The very same condition arises when the membranes rupture at the commencement of labour. The bag of membranes not only acts as a mechanical dilator, but also, by its pressure through the os, reflexly stimulates uterine contractions, so that its want is of considerable disadvantage.

Treatment.—With a small amount of liquor amnii and the membranes unruptured, patience will be required. The patient's strength should be supported, and she may be given opium or chloral in full doses. In administering chloral, I usually give a drachm of the syrup—*i.e.*, 10 grains every quarter of an hour until four doses have been given. It sometimes has a wonderful effect in causing relaxation of the cervix. In these cases I have sometimes found it useful to rupture the membranes when the os is about half dilated, as that allows of the presenting part bearing more directly on the cervix. If the patient is becoming exhausted, one should not wait too long, but put her under chloroform and finish the dilatation manually, and deliver.

Early Rupture of the Membranes is often associated with a malpresentation, but these cases will be dealt with under malpresentations. At present we shall deal with cases where the head or breech presents and there is no obstruction. The presenting part acts fairly well as a dilator, if the pains are good, and one may wait patiently so long as the pressure upon the child is not acting injuriously on it. If the pains are inefficient, chloral or opium may be used. A close watch must be kept on the fœtal heart, and if it begins to show irregularity, or much slowing or quickening, artificial means of dilatation must be adopted. Barnes' or Champetier de Ribes' bag may be used, especially when the os will only admit two fingers, but manual dilatation under chloroform is the quickest method. If the cervix is rigid, and it is evident that the child is suffering very much, a number of incisions should be made through the cervix, and this will allow of quick dilatation. Some authorities advise the application of the forceps when the os will admit four fingers. This may be done, provided delivery is very slowly effected, but there is considerable risk of tearing the cervix badly, if the operation is done hastily. Personally, I prefer to dilate the cervix to as near its full extent as possible before applying the instruments. If the cervix is in a condition to admit of delivery you will have no difficulty in dilating it with your hand when the patient is under chloroform, and if you cannot do it with your hand the forceps should not be applied, or you will be sure to cause a bad tear. In such a case it is far better to incise in different directions, and then dilate before delivering. Bossi's dilator may be used instead of incisions.

Adhesion of the Membranes.—Sometimes the membranes are adherent in the lower pole of the uterus. This prevents the bag of membranes from protruding into the os.

Treatment.—Pass the finger in, and separate the membranes as high as you can reach, and this will allow the usual bag to form, and there will probably be no more difficulty.

Delay from Malpositions, Malpresentations, and Deformities of the Fœtus.—In all of these the presenting part does not, as a rule, fit well in the brim, and, as a consequence, the membranes usually project in a sausage shape and rupture early.

Treatment.—Keep the membranes intact as long as possible. If they rupture early, insert a Champetier de Ribes' or a Barnes' bag, and finish the dilatation manually, if necessary. These cases will be more fully dealt with later in discussing the methods of treatment of abnormal cases.

CHAPTER XX

DELAY IN THE SECOND STAGE OF LABOUR

Failure in the Primary Powers—Uterine Inertia—Irregular Uterine Contractions—Failure in the Secondary Powers—Delay from Faults in the Soft Passages—Impaction of the Anterior Lip of the Cervix—Prolapse of the Vagina and Cystocele—Distention of the Bladder or Rectum—Rigidity of the Vagina and Perineum—Cicatricial Contraction of the Vagina—Persistent Hymen—Vaginismus—Tumours of the Vagina or Vulva—Venereal Warts—Obstruction of Labour by Tumours of the Uterus: Cases—Obstruction from Tumours of the Adnexa: Cases—Hernia into Douglas's Pouch.

THE normal second stage of labour begins when the os is fully dilated and the membranes rupture. It may only last a few minutes, or it may be prolonged for many hours. Under ordinary conditions one may say that there is very little danger in the first stage either to mother or child, provided the membranes are unruptured; but in the second stage the danger to both is much increased. In the great majority of cases, however, if the second stage is not unduly prolonged. neither mother nor child will suffer any harm. It is exceedingly difficult to make any definite statement as to what ought to be considered a normal second stage as regards length. What is perfectly safe in one case may be exceedingly dangerous in another. Each case must therefore be judged upon its own merits, and prompt assistance must be rendered as soon as it is necessary, in the interest of either mother or child. The interests of the mother are of course paramount, but it must not be forgotten that the unborn babe, too, has rights which should be considered. In many cases interference is clearly called for, either in the interests of the mother or of the child, but there are others of simple inertia uteri where there is no immediate danger to either mother or child. In these latter should one wait indefinitely, or only for a stated time? Some authorities advise leaving such cases to Nature until the woman begins to show indications of exhaustion by the temperature rising and the pulse quickening. I cannot agree with this. Our rule in connection with the outdoor department of the Maternity Hospital is that the nurses or students shall send for assistance in cases of inertia if no advance is being made by multiparæ after two hours in the second stage, and by primiparæ after three hours. By the time assistance has arrived another hour will have passed, and if no advance is being made the forceps are applied. This allows three hours in the second stage for multiparæ and four for primiparæ. Each case must be judged on its own merits, but I consider this a reasonable time to wait on Nature. If delivery is effected with proper care, there will not be any added risk, and the woman will be saved considerable suffering. There are many cases in which we are called upon to interfere much sooner, but with these we shall deal shortly.

Failure in the Primary Powers—Uterine Inertia.—We shall now consider the causes of delay from failure in the powers. The primary powers are the uterine contractions, and the secondary the contractions of the abdominal muscles. Failure in the primary powers, or uterine inertia, is the commonest of all causes of delay in the second stage. The uterine muscle, like any other muscle, can only do a certain amount of work, and, if it is overtaxed, failure in the contractions must occur. If the muscle is in a strong, healthy condition, and the uterus is not overdistended, inertia will not occur for a considerable time, but in a case where there is weakness in the uterine wall from disease or overwork, as in cases of frequent and rapid childbearing, or where the wall is overstretched by hydramnios or a multiple pregnancy, inertia will supervene early in the second stage. Again, if the first stage has been unduly prolonged, the contractile powers will to a large extent be used up, and the uterus be unfit for any more work until it has had a rest. In patients who are constitutionally weak the uterus may partake in the general weakness of the muscular system, but this is not invariably the case. For instance, in phthisis I have seen a number of advanced cases where the uterine contractions were quite strong, and the labour exceptionally easy and quick. In such cases the child is apt to be small, and the emaciation of the patient also allows of an easy passage.

Irregular Uterine Contractions.—Irregular uterine contractions may arise from disease of the uterine wall, from exhaustion, or from the irritation of too frequent examinations. A full rectum or bladder will also cause them reflexly. They cause excessive suffering, and have practically no effect in advancing the labour.

In a properly conducted labour, except where there is disease of the uterine wall, these irregular contractions should not arise. It is surprising, however, how often an overdistended bladder is overlooked.

Failure in the Secondary Powers.—In cases of chest disease the patient may not be able to fix her diaphragm, and she will thus be prevented from bearing down. If the abdominal muscles have been overstretched, as by frequent pregnancies, they will not contract well. Separation of the recti muscles will give rise to much the same condition, as the uterus falls forwards between the muscles, and is not compressed by them. This condition is common after an abdominal section, but is often seen in cases where there has been no section. I have seen it in a primipara. In such cases, in addition to the failure of the secondary powers, the abnormal position of the uterine axis hampers the action of the primary powers, as the child is not driven into the brim, but against the posterior wall. Overdistention of the abdomen from ascites, a tumour, or even a full bladder, will hamper the action of the secondary as well as the primary powers. If peritonitis be present, the pain will prevent the secondary powers acting.

Hemiplegia, or even paraplegia, as a rule, does not affect the primary powers, but the secondary powers will be more or less weakened.

The loss of one or both legs will interfere with the secondary powers, as the patient will not be able to bear down strongly.

Treatment.—Remove the cause, if possible, and wait on Nature a reasonable time, but not indefinitely. The primary powers may be stimulated by hot stupes to the abdomen or by massaging the uterus. Ergot should not be given. The action of the secondary powers may be assisted by applying a tight abdominal binder. In most cases artificial delivery will be necessary by forceps, when the head presents, or by traction, if it is a breech case. Care must be taken to guard against post-partum hæmorrhage, especially when chloroform has been administered.

Delay from Faults in the Soft Passages.—If the cervix is elongated, delay will be caused. In the first place it will not dilate well, and the membranes are apt to rupture early, thus giving a long first stage, which will probably lead to inertia in the second stage. When full dilatation has occurred, the cervix will not have disappeared as in an ordinary case, but there will be a considerable channel through which the presenting part must pass. Considerable resistance will be encountered and the labour will be slow.

Treatment.—When Nature fails, deliver artificially. Do the operation slowly, to prevent laceration. There will frequently be a tendency for the whole uterus to prolapse, so the cervix must be supported and pushed above the presenting part during delivery.

Impaction of the Anterior Lip of the Cervix.—In these cases the anterior lip of the cervix is somewhat elongated, and it gets nipped between the head and the symphysis pubis. It quickly becomes œdematous from the pressure, and may protrude at the vulva.

Treatment.—Support the swollen lip, and press it up over the presenting part, especially between the pains.

Prolapse of the Vagina and Cystocele.—A very lax vaginal wall will obstruct by being prolapsed before the presenting part. The anterior wall is the one which gives most trouble. Along with it the bladder prolapses, causing a cystocele, and this may seriously obstruct if there is much urine in the prolapsed portion of the bladder.

Treatment.—Empty the bladder and push the prolapsed portion above the presenting part between the pains, and keep it up during the pains.

Distention of the Bladder or Rectum has already been referred to as causing irregular contractions and interfering with the action of the secondary powers. A tumour in the rectum or bladder, or a vesical calculus, would have the same effect. Besides the effect on the contractions, there would be direct blocking.

Treatment.—Empty the bladder or rectum. There will probably be some difficulty in passing a catheter, but this can be done in the interval between two pains by pushing the presenting part up. If it obstructs, a tumour or calculus should be removed.

Rigidity of the Vagina and Perineum.—This is usually seen in primiparæ, especially in elderly ones.

Treatment.—Hot sitz-baths and hot vaginal douches assist relaxation. If an antiseptic is used in the douche, it must not be corrosive sublimate, or more harm than good will be done. Lysol makes the best douche, as it lubricates the passage. Hot fomentations to the perineum are useful. When the perineum is very rigid, incisions are sometimes made at each side of the vulva, but I do not approve of them. I prefer putting the patient deeply under chloroform, and delivering the head slowly with forceps. In this way the perineum can often be saved. If it does tear, it should be stitched at once. The method of supporting the perineum in natural delivery has already been described.

Cicatricial Contraction of the Vagina.—This arises from former tears, ulcers, etc. The contraction may be so great as almost to close the passage. As a rule, great relaxation and softening occur during the labour, and in many cases the obstruction disappears.

Treatment.—When the constriction persists, it should be freely incised in a number of places. Delivery may be left to Nature, but forceps will generally be required. If necessary, the parts may be stitched after delivery.

Persistent Hymen.—This condition is occasionally seen. In one case I found a very strong fleshy hymen with two very small openings in it. On tearing it through, it bled profusely, and it was necessary to catch and tie the vessels.

Treatment.—Rupture the hymen.

Vaginismus.—As a rule, this condition disappears as labour advances, but I have seen a case where it was impossible to make a vaginal examination without giving chloroform. I made one examination at the commencement of labour, and then allowed matters to take their course for about fifteen hours. I then chloroformed the patient again, and found the os fully dilated, so I delivered with forceps. The patient was completely cured of her vaginismus.

Tumours of the Vagina or Vulva.—You may have a solid tumour in the vaginal wall, but cysts are more frequently found. In the vulva you may have a hæmatoma. The following case will illustrate this: The patient, a primipara, was brought into the hospital on account of a large hæmatoma of the right side of the vulva. The second stage of labour was well advanced, and the head low down, but further progress was blocked by the hæmatoma, which was nearly as large as a fœtal head. A free incision was made, and the clot turned out. There was some oozing, but no bleeding from large vessels. The child was delivered with forceps, and the large gaping wound stitched up from the bottom by a continuous catgut suture. The wound healed by first intention.

Venereal Warts of the vulva may form a serious obstruction, as they are sure to be exceedingly septic. The following case is probably a unique one, as the patient, a primipara, had a lateral placenta prævia: The whole of the vulva was covered with large warty growths, which also encircled the anus. The mass was exactly like a cauliflower, and larger than a fist. Most of the growths had narrow pedicles, but a number, especially on the posterior vaginal wall, just within the fourchette, were sessile. They were evidently gonortion slowly, to prevent laceration. There will frequently be a tendency for the whole uterus to prolapse, so the cervix must be supported and pushed above the presenting part during delivery.

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After cleansing the mass as thoroughly as possible, I plugged the vagina to control the bleeding from the placenta prævia, and removed the entire mass, stitching up each incision as I went on. The bleeding was free, but the stitches controlled it. As the os was sufficiently dilated by this time, I turned and delivered the fœtus. It was alive, but too premature to survive.

The patient remained free from sepsis, and all the incisions, except those round the anus, healed by first intention.

Treatment of Tumours of the Vagina and Vulva.—Solid tumours should be removed, and, if practicable, cysts also. The latter may be incised to evacuate the contents. It may be possible to drag the head past the tumour, but this should not be done, as the crushing of the tumour will cause subsequent sloughing, and the patient be exposed to great risk from sepsis. After the child is delivered the part should be stitched, or plugging may be used.

Obstruction of Labour by Tumours of the Uterus.—Tumours of the uterus itself often prevent conception, and when conception occurs the pregnancy may be interrupted, but in some cases full time is reached. The effect upon the labour will depend upon the position, size, and consistence of the tumour. An interstitial or subserous fibroid is the usual form of tumour met with. The submucous variety, as a rule, prevents conception, but it is occasionally met with, especially in conjunction with one of the other forms. A malignant tumour of the body of the uterus would prevent conception, or if conception should occur, an early abortion would be sure to result.

If the tumour is situated low down, even although it may not be very large, it will be almost sure to obstruct, unless it is sufficiently movable to allow of its being pushed above the brim of the pelvis. A small tumour, or even a fairly large one, situated high up in the uterus, may not seriously obstruct the labour by actual blocking, but it will interfere with the uterine contractions, and probably so displace the uterus as to cause a deviation in the uterine axis.

The first stage of labour is usually interfered with and prolonged, and, if the tumour be a large one in the lower part of the uterus, dilatation may be prevented. It is usually in the second stage that the most difficulty arises. In the third stage there is considerably more risk from post-partum hæmorrhage than in an ordinary case.

Diagnosis.—This is not usually difficult. It will be easy to make out a hard mass connected with the uterus. If it is low down, it will be easily felt *per vaginam*, distinct from the presenting part.

Prognosis.—If the tumour is likely to obstruct the passage, the condition is very serious, but if it is high up, the risk is not very great. There is considerable risk of post-partum hæmorrhage, and, if there should be any bruising of the tumour during labour, sepsis is apt to supervene, and the condition will then become a very grave one. The risk to the child will be considerable, and will depend upon the amount of obstruction and the method of delivery which has to be adopted.

The following cases will illustrate some of the important points :

CASE I.—A primipara, aged thirty-two, was seen by me in consultation. Prior to her pregnancy she had been treated by her medical attendant for fibroids of the uterus. There were several small tumours in different parts of the uterine wall. When I saw her the os was fully dilated, and the head presenting. The first stage of labour had been somewhat tedious. None of the tumours were low down, so there was no obstruction. The patient was beginning to show indications of exhaustion, so chloroform was administered, and I easily delivered a live child by means of axis-traction forceps. When the placenta came away the entire chorion was left behind. It was very adherent, and had to be removed bit by bit. The bleeding was free, but not alarming, and was easily controlled by a hot douche and a hypodermic of ergot. She made a good recovery.

CASE II.—A primipara, aged thirty-eight, seen in consultation. As her usual attendant was absent on holiday, I received no history of the presence of tumours. The uterus was very large, and at its upper part there were two distinct rounded masses which felt very like fœtal heads. A breech presented, so the case looked very like one of twins. Under chloroform, an extremely large child was delivered alive without much difficulty. The second mass at the fundus was then seen to be a fibroid. As the placenta could not be expressed, the hand was passed into the uterus, and a second fibroid was found low down on the posterior uterine wall, blocking the way. The chorion was adherent all over, as in Case I. The lower fibroid was about the size of a closed fist. It was submucous, and I could easily have shelled it out, but decided to leave it. It was remarkable that it had not obstructed the descent of the head. The upper tumour was a subserous one. There was very little loss of blood.

The patient made a good recovery. She was quite unaware of the presence of the tumours.

Case III.—Mrs. H., 6-para, aged thirty-six. This patient was sent into the hospital with a history of pretty severe ante-partum hæmorrhage. The bleeding had commenced in the morning, and had continued more or less throughout the day. She had evidently lost a good deal of blood. Her pulse was 144, and the temperature 97·2° F. The cord was prolapsed and pulseless.

On examining her I found the cervix dilated and the head partially engaged. To the right and behind the cervix there was a flattened-out tumour partially blocking the passage. It felt very like a fibroid in the lower part of the posterior wall of the uterus, but it might possibly have been a dermoid of the ovary. Delivery was effected by forceps after perforation. If the child had been alive, I might possibly have delivered it with forceps. A hot douche checked all bleeding. She was stimulated with strychnine hypodermically. She made a good recovery.

Case IV.—Mrs. M., 9-para, aged forty-three, full time, was sent into hospital almost moribund from hæmorrhage. The uterus was tonically contracted, and a small subserous fibroid was felt about the level of the umbilicus. The cord was prolapsed and pulseless. A vaginal examination revealed a large fibroid completely blocking the cavity of the pelvis. The os was high up and to the front at the level of the top of the symphysis pubis. It admitted two fingers transversely.

The doctor who sent her in had attended her in all her former labours, which had been normal, but, so far as we could learn, had not known of the presence of the tumour until he was called to her at the commencement of the present labour. He had unfortunately not recognised the gravity of the condition when he saw her first, but had ruptured the membranes to check the bleeding. This had checked the bleeding, but it had allowed the cord to prolapse.

Some seventeen years before the patient had torn her urethra by falling against something. This had been successfully repaired. She had a large recto-vaginal fistula, but whether or not it was the result of the same accident we could not ascertain. Her last child had been born two years before without any difficulty. Her periods had been profuse, but she had never flooded. During the present pregnancy she had been under treatment for dropsy. We found a considerable amount of albumin in her urine.

The case appeared utterly hopeless. Craniotomy was out of the question, so there was no alternative but to leave her to die undelivered, or to do an extirpation or a Porro's operation. I decided to do the latter as quickly as possible.

On opening the abdomen, it was impossible to get an elastic ligature round the uterus before emptying it, so it was incised and the child removed. The tumour was attached so low down on the posterior wall, and so jammed in the pelvis, that considerable difficulty was experienced in getting it up and putting an elastic ligature round the cervix. The tumour and uterus were cut away, and the stump, clamped with a wire écraseur, was fixed in the lower end of the wound with pins. The outer part of the broad ligaments had to be stitched. About a quart of normal saline solution was left in the peritoneal cavity. The abdominal wound was closed in the usual way. She stood the operation well, but was sick for twenty-four hours. Unfortunately we could not feed her by the rectum, as the fistula prevented retention. She did very well for forty hours, and we were beginning to have hopes of her recovery, when she suddenly collapsed and died within an hour, apparently from delayed shock. There was no hæmorrhage.

I was not surprised at the result, as I scarcely expected the patient would leave the operating-table alive. Had we got her for treatment when labour first commenced there would have been a good chance to save both mother and child, but to do such a serious operation on an almost pulseless patient gave only an exceedingly faint hope of saving her.

Treatment in Labours Complicated with Fibroids of the Uterus.--The treatment to be adopted will depend upon the situation and size of the tumour. Small tumours situated high in the uterine wall will not, as a rule, call for any severer operation than forceps or turning. Neither will large tumours in the same situation, unless they have grown downwards sufficiently to partially or wholly obstruct the inlet. The difficult cases are those in which the tumour or tumours are situated low down, so that they partially or entirely obstruct the brim. If the tumour has a pedicle which will allow of its being pushed out of the way, this may be done, and delivery effected by forceps or version; but if the tumour is immovable, one should not attempt to deliver by the natural passages, unless there is sufficient room to allow of the passage of the child without much pressure being exerted on the tumour. If the child is dead, craniotomy should be done, as in Case III. In that case, if the child had been alive, I might possibly have delivered it with forceps, but there would have been some risk from pressure. Where it is quite evident that the child cannot be delivered without exerting undue pressure, and the child is still alive, an abdominal section should be done, and the uterus and tumour removed either by Porro's operation, total extirpation, or by supravaginal amputation and treating the stump extraperitoneally by stitching the peritoneum over it. In cases of complete obstruction, no matter whether the child be dead or alive, the abdominal operation must necessarily be done.

When delivery is effected by the natural passages, post-partum hæmorrhage must be guarded against. In two of my cases the chorion was completely adherent.

During the puerperium sepsis may occur, and if it does the outlook for the patient will be serious. I am now referring to cases where delivery has been by the natural passages. In such a case I would be inclined to extirpate the uterus and tumour at the first indication of any serious septic absorption.

Involution will occur in the tumour as well as in the uterus.

Obstruction from Tumours of the Adnexa.—Solid or cystic tumours of the adnexa may obstruct labour as seriously as tumours of the uterus itself. The amount of obstruction will depend upon the position, size, and consistence of the mass. As cystic tumours are liable to have more or less of a pedicle, they are very apt to be pushed down in front of the presenting part, especially when they are of a medium size. Twisting of the pedicle is liable to occur during the pregnancy, and especially during labour, and this may lead to very serious results if the tumour is not promptly removed before necrosis sets in. Ovarian or other tumours will interfere with the first stage of labour in the same way as fibroids do, and if the tumour is prolapsed into the pelvis, it may completely block the passage, and not only prevent dilatation of the cervix, but also the passage of the child. Besides the risk of twisting of the pedicle, the tumour may be so injured by pressure as to afterwards become gangrenous; it may be ruptured; and in a few rare cases, especially of dermoids, it has even been forced through the posterior fornix, and expelled at the time of labour.

Case I.—*Parovarian Cyst.*—Mrs. T., 1-para, aged twenty-five. When first seen this patient was well on in the first stage of labour. The head was partially fixed in the brim. Immediately below the promontory a flattened-out cystic tumour about the size of a small orange was felt. It could be very distinctly felt through the rectum. It seemed to me to be a simple thin-walled cyst, probably a parovarian one. The obstruction was not very great, but the cyst could not be pushed up past the head, as it was caught below the promontory. As there seemed to me to be room for the head to pass, I decided to use forceps cautiously. Keeping my finger against the cyst, I made traction, and as the head began to advance, I suddenly felt the cyst rupture. Delivery of a live child was easily effected. The patient did not suffer in the least from the sudden rupture. She made a good recovery.

I think the result showed that the diagnosis of a parovarian cyst had been correct.

CASE II.—*Ovarian Cyst.*—Mrs. S., 1-para, aged thirty, was first seen by me in consultation when she was eight months pregnant. She had a tumour of the right ovary about the size of a large orange. It had a fairly long pedicle. No inconvenience had been experienced from it until a day or two before I saw her, when she had been seized with severe pain after doing some heavy work. Her medical attendant found that the tumour had slipped down in front of the uterus. He was able to push it up. When I saw her the tumour was well up and quite movable. The pain had lessened considerably. It looked as if there had been some twisting of the pedicle, which had been relieved by replacing the tumour.

The question we had to decide was whether or not to operate. If the pedicle was twisted, an operation was called for at once; but as there was no increase in the size of the tumour, and the pain had almost gone, and the temperature and pulse were normal, we decided to wait and watch the patient carefully.

She went to full time and was easily delivered with forceps, as the tumour did not obstruct. She made a good recovery.

CASE III.—*Suppurating Dermoid of the Left Ovary, and Obstruction of the Bowels from Adhesions.*—Mrs. McC., aged thirty-nine, 19-para, was brought to hospital in a very collapsed and hopeless condition. She had been in labour for four days, and during that time there had been no movement of the bowels. The abdomen had been steadily increasing in size, and vomiting had been incessant for the last day or so.

She was seriously collapsed, with a very feeble pulse and an anxious, pinched expression. The abdomen was extremely distended. No distinct tumour other than the uterus could be felt. The vomit was distinctly fæcal. The os was partially dilated, and the head presenting.

I dilated the cervix manually, and delivered a dead child by version. The patient was very freely stimulated by means of a large saline injection under the breast and strychnine hypodermically. An oblong, indistinct swelling could now be made out to the left of the uterus, but it was impossible to say whether it was a tumour or bowel distended with fæces. A very large enema was given as high up into the bowel as possible, but failed to bring away any fæces.

Two hours after delivery I opened the abdomen. A large number of adhesions were found, and to the left and above the uterus an oblong cyst of the left ovary was discovered. It was firmly attached to the bowel by adhesions. The bowel was narrowed for 1 inch to about one-half its lumen. It was very dark in colour. In separating the strongest adhesion, the cyst wall, which was very friable, gave way, and fœtid pus escaped. When the cyst was removed it was found to be a suppurating dermoid of the left ovary. The abdomen was well flushed with normal saline solution, and a large quantity of the solution allowed to remain in the peritoneal cavity. As the bowel was patent, although narrowed, it was not touched.

The patient regained consciousness, but never rallied. She died six hours later. I opened the wound after death and removed the constricted bit of bowel. It was quite patent.

We subsequently learned from the friends of the patient that early in pregnancy this tumour had been discovered at the Victoria Infirmary, and she had been advised to have it removed, but had declined. Although the patient and all her friends were quite aware of the presence of the tumour, for some reason or other they refrained from mentioning the fact, either to those who saw the patient before she was sent into hospital or to any of us in the hospital, until after I had operated. I suppose it was the dread of an operation which had kept them quiet. If the patient had been operated on early in labour she would have had a good chance of recovery, but it was utterly hopeless after four days of obstruction of the bowels. The best time to have dealt with this tumour was early in pregnancy, when it was first discovered at the Victoria Infirmary.

It is rather remarkable that this patient should have passed through eighteen labours without any difficulty, and apparently without the tumour having been discovered. I do not think she had ever been attended by a medical man.

Case IV.—Mrs. W., 7-para, aged thirty-four years, was sent into hospital by Dr. John Lindsay on account of a tumour obstructing labour. The labour had lasted seven hours. On examination we found the os was partly dilated, and the head was at the brim. In the posterior fornix there was a tumour as large as a fair-sized orange.

It was very tense, and had one or two projecting nodules on it, but it was not quite hard enough for a fibroid. An ovarian cyst, probably a dermoid, was diagnosed.

As the tumour was fixed in the pelvis, and could not be pushed above the brim, I decided to remove it by the abdominal route. The vaginal route might have been selected, but I decided against it, as I was quite sure there were adhesions, and, what was of more consequence, only a part of the tumour was below the brim. On opening the abdomen, I found the tumour was one of the right ovary, closely adherent to the back of the uterus, low down, and with only a portion of it in the pelvic cavity. To get it up it was necessary to turn the uterus out of the abdomen, and this necessitated a long abdominal incision. The adhesions were broken down and the tumour removed. We then returned the uterus into the abdomen, clamped the edges of the abdominal wound together, and my resident, Dr. Cameron, delivered the child with forceps in the ordinary way. The child was alive. The abdomen was then closed in layers. The patient made an uninterrupted recovery.

The main portion of the tumour was filled with pultaceous material, and there were in addition several small cysts with clear gelatinous contents.

Treatment of Tumours of the Adnexa.—If the tumour is discovered early in pregnancy it should be removed at once, even although it is small, as the risk of twisting of the pedicle is considerable. If the pedicle should become twisted, immediate operation is called for. If the tumour is not discovered until within a few weeks of full time, I should be inclined to wait to full time, unless, of course, there should be a good reason for operating at once. The reason for this is that the abdominal wound would not have time to become consolidated before labour came on, and it would probably yield.

In cases where full time has been reached, and labour has come on, one must be guided by much the same principles as with tumours of the uterus itself. If the tumour is high up no great difficulty may be experienced, but if it is actually obstructing, one should try to push it up out of the brim, so as to allow of the passage of the child. If this cannot be done, or if there is likely to be injurious pressure during delivery, delivery should not be attempted through the natural passages until the tumour has been removed by abdominal section. Tapping the tumour through the vagina or abdominal wall has been advised, but this is not a proceeding I would care to adopt. With a small tumour in Douglas's pouch, the vaginal method of operation could be adopted. When the tumour has been removed, delivery should be effected through the natural passages.

In cases where delivery has occurred, and a fairly large tumour is left, the question of operating immediately, during the puerperium, or some time later, will have to be settled. On the whole, I should be inclined to wait until the puerperium was over, unless there was evidence of bruising of the tumour or twisting of the pedicle, when immediate operation would be called for. A sudden increase in the size of the tumour, or great pain in it, would be urgent indications for operation.

Tumours connected with organs other than those of the pelvis might easily cause serious obstruction. For instance, a movable kidney, or the rare condition of a horseshoe kidney, might easily block the passage into the brim. I have never met with a case, but, if I should, I would treat it by doing an abdominal section if the obstruction could not be pushed out of the way.

Hernia into Douglas's Pouch.—The bowel is sometimes prolapsed into Douglas's pouch before the presenting part. A softish, gurgling, oblong mass will be felt.

It can usually be pushed out of the way, but, if not, delivery should be hastened by artificial means, so as to relieve the pressure. In pushing any obstruction out of the pelvis, the knee-elbow position will assist matters, but when the patient is under chloroform it is difficult to place her in this position. The Trendelenburg position should then be tried.

CHAPTER XXI

DELAY FROM OBSTRUCTION IN THE PELVIS

Methods of Diagnosing a Contracted Pelvis—Measurement of a Contracted Pelvis—Method of Increasing the Length of the True Conjugate during Delivery (Walcher's Position)—Risks to the Mother during Pregnancy and Labour—Abnormal Pelvis (Æquabiliter Justo Major Pelvis)—Contracted Pelvis (Æquabiliter Justo Minor Pelvis)—Generally Contracted Rickety Pelvis — Case — Antero-Posterior Contraction — Flat Rickety Pelvis — Diagnosis of a Flat Pelvis—Mechanism of Labour in a Flat Pelvis—Forceps *versus* Turning—Injuries to the Skull, etc., during Delivery—Cases —The Pelvis of Congenital Dislocations of Both Hips—Split Pelvis—Case of Exstrophy of Bladder and Split Pelvis—Spondylolisthetic Pelvis.

THIS is usually caused by contraction of one or more of the diameters of the pelvis, either at the brim or outlet, or at both. The contraction may be from deformity of the pelvis, or from a tumour. The former condition is much commoner than the latter.

The commonest form of contracted pelvis met with in Glasgow is the flat and rickety. In the Maternity Hospital fully 10 per cent. of our cases present this deformity in a marked degree, and many others slightly.

Methods of Diagnosing a Contracted Pelvis.—Many of the women show more or less deformity of the legs, or spine, or of both. The arms may also be deformed, and the forehead be heavy and square. In most cases the abdomen will be pendulous. If a primipara is observed to have a pendulous abdomen, contraction of the pelvic brim should be at once suspected. Deformity of the legs or spine does not, however, invariably mean deformity of the pelvis, as one occasionally sees cases of even marked deformity of these without the pelvis being affected. Abdominal palpation is a very valuable method of diagnosis, especially at or near full time, when the head presents. The disproportion between the size of the head and the brim of the pelvis can easily be made out.

Measurement of a Contracted Pelvis.—The most important external measurements are the intercristal and interspinous. These will be found to be abnormal, but not necessarily shortened (in some instances, as in flat pelves, they may be actually increased). In a normal pelvis the difference between these two diameters should be about 1 inch. With a contracted pelvis, especially a flat one, this difference will not exist. The interspinous diameter will be nearly, or quite, as great as the intercristal one. The external conjugate diameter is measured from just below the tip of the spine of the last lumbar vertebra to the front of the pubis. As a guide to the length of the true conjugate it is very fallacious, as it is impossible to estimate how much should be deducted for the thickness of the sacrum behind and the symphysis in front. Oblique and transverse measurements are also made, but they are of very little use. The important external measurements are the intercristal and interspinous—*i.e.*, the distance between the widest points of the iliac crests, and between the anterior superior spines. In a normal pelvis the former should be 1 inch longer than the latter. A fair-sized pelvis would give 11 and 10 inches respectively.

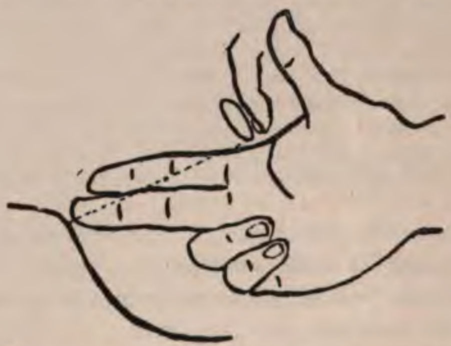

FIG. 25.—MEASURING THE DIAGONAL CONJUGATE (FOTHERGILL).

The most important diameter of all is the *diagonal conjugate*, as from it a very accurate estimate of the true conjugate can be made. It is measured from the centre of the promontory to the lower edge of the symphysis. In a normal pelvis it is ½ inch longer than the true conjugate, but in deformed pelves ¾ inch should be allowed, on account of the greater thickness and depth of the symphysis pubis. In the living subject the diagonal conjugate can be easily measured, especially if the patient is anæsthetized. Various pelvimeters have been invented for taking the measurement, but none of them are better than—nor in my estimation as good as—the fingers. The measurement can be taken with the patient lying either on her back or left side. The fore and middle finger of one hand are passed into the vagina and pressed up until the tip of the middle finger touches the centre of the promontory. The position of the lower edge of the symphysis pubis is then marked on the edge of the hand with the nail of the forefinger of the other hand. The distance from this point to the tip of the middle finger gives the length of the diagonal conjugate. By subtracting ¾ inch from this in an abnormal pelvis you get a very fair estimate of the length of the true conjugate. In a normal pelvis it is difficult to reach the promontory, unless your fingers are exceptionally long; therefore in every case in which the promontory is reached with ease some contraction is likely to exist. On the other hand, if you cannot reach it, you may feel pretty confident that the conjugate is not contracted.

In some cases a double promontory is met with, or there may be a ridge on the sacrum which feels very like the promontory, so care must be taken to make sure that you have reached the centre of the true promontory—*i.e.*, the higher one.

The most accurate method of gauging the size of the conjugate is by passing the fingers or the closed hand in, and rotating the hand into, the conjugate. If the conjugate will allow the hand to pass easily, the thumb may be placed by the side of the hand and the exact size estimated. My hand happens to be small, and only measures 3 inches across the knuckles, so that, when I find it will just pass, I know I have to deal with a 3-inch conjugate. If you know the size of your hand you need no other measure. This examination can only be made under chloroform, and is best done when the os is fully dilated. After delivery it is very easily made.

When measuring the size of the conjugate one should always explore the shape of the inlet by sweeping the fingers round. One side of the pelvis may be found to be quite roomy. The size of the arch of the pubes should also be estimated, and the curve of the sacrum and amount of projection and movability of the coccyx. The distance between the ischial tuberosities should also be ascertained. After some experience one can very quickly form an estimate of the size and shape of a pelvis, and the likelihood of difficulties arising during labour.

Method of Increasing the Length of the True Conjugate during Delivery.—The sacro-iliac joints do not admit of much movement, but when weight is applied to the front of the innominate bones they allow of a certain amount of rotation of these bones. By placing the patient in the Walcher position it is possible to enlarge the true conjugate about ⅓ inch. The patient must lie on her back with her hips at the edge of the bed or table, and her legs hanging down. The feet must not touch the floor or be supported in any way. The weight of the legs drags on the front of the pelvis, principally through the Y ligament of Bigelow. The innominate bones are thus dragged down from the sacrum, rotation taking place round the sacro-iliac joints. The symphysis pubis is drawn down and away from the promontory, and the true conjugate is lengthened about ⅓ inch. The conjugate at the outlet is slightly decreased as the symphysis pubis is brought nearer the coccyx, so that, as soon as the head has passed the brim, the patient should be placed in the

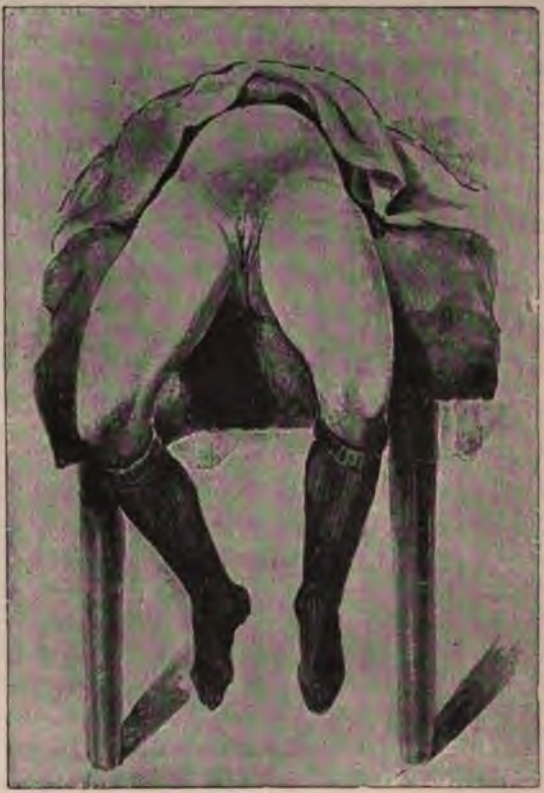

FIG. 26.—WALCHER'S POSITION (FOTHERGILL).

ordinary position to complete delivery. The gain of only ⅓ inch may not seem very much, but when the pelvis is contracted it will often enable you to deliver a live child when this could not be done in the ordinary obstetric position.

The pelvis may also be enlarged by the opening up of the symphysis pubis, either accidentally or by the operation of symphysiotomy. I have only once seen this happen accidentally, in the delivery of an after-coming head by suprapubic pressure through a flattened pelvis.

Risks to the Mother during Pregnancy and Labour.—During pregnancy the head is prevented from sinking into the pelvis, and as a consequence the uterus is high in the abdomen. The inter-abdominal pressure is thus increased, and the uterus is very liable to deviate to one or other side, or more frequently forwards, causing a pendulous abdomen. The patient will thus suffer from pressure symptoms. During labour the head may not fit into the brim, so the bag of membranes will protrude in a sausage shape and rupture early, and dilatation be much delayed, or even prevented, if the head is unable to descend. If the contractions continue, the lower uterine segment will thin out, and Bandl's ring become apparent. There is then great risk of rupture of the uterus. If there is room, the fœtus may ultimately be expelled, but its head will be excessively moulded, and the bones sometimes indented or fractured by the pressure of the promontory, while the mother's soft parts may suffer from bruising and laceration. If the contraction is too great to allow of the passage of the fœtus, the uterus will either rupture, or the patient will die of exhaustion.

During pregnancy the risks to the fœtus are not any greater than in an ordinary case, but during delivery they are enormously increased.

Abnormal Pelvis (Æquabiliter Justo Major Pelvis).—This is not a contracted pelvis, but a uniformly enlarged one. It might be called a giant pelvis. The woman may not be very tall, but she will be large framed.

The only effect this kind of pelvis has on labour is to allow of it being quick and easy. A precipitate labour is more likely to occur with this than with an ordinary-sized pelvis.

Contracted Pelvis (Æquabiliter Justo Minor Pelvis).—The justo minor pelvis is contracted, but not deformed. It is merely a small pelvis of normal shape. All the diameters are equally contracted. In some the contraction is very slight, and has little effect on labour, while in others it may be sufficient to render labour very difficult.

The patient may be a small woman, but she is not necessarily so. Many small women have perfectly normal pelves. The promontory will be reached with ease, and the diagonal conjugate found under 4½ inches. The transverse diameters will be smaller than usual.

Labour in a justo minor pelvis is more difficult than in a normal one. The mechanism of labour is the same, only flexion must be very marked, to allow as small a diameter as possible to pass. Artificial delivery will very likely be necessary. These are typical cases for forceps. If forceps fail, and the child is still alive, a symphysiotomy may be done. If the child is dead do a craniotomy. Cæsarian section will rarely be necessary unless the child is very large. If the head fails to enter the brim, and is evidently too large to pass, a section will be called for, if the child is alive. If great difficulty is experienced in delivering the child in the first labour, an induction of labour should be done in subsequent pregnancies.

A Generally Contracted Rickety Pelvis is sometimes met with. The promontory will be pushed forward somewhat, so the conjugate diameter will be shortened, but there will not be the lengthening of the transverse diameter which is characteristic of a true flattened pelvis. The development of the pelvis has been interfered with by rickets, but the softening of the bones has not been sufficient to allow of great flattening of the pelvis.

CASE.—Mrs. McC., 6-para, aged twenty-nine years, conjugate vera, 3 inches ; transverse at brim, 3¼ inches.

This patient, who showed indications of rickets, had had induction of premature labour done three times, the last two times by myself. The first time I had done induction I had delivered her of a live child with forceps. The delivery was very difficult, and the frontal bone was deeply indented by the promontory. The child lived for twelve months, and then died of tubercular meningitis. The second time the child only lived a few hours. Its skull had evidently been fractured. In her first induction the child had been lost. In this sixth pregnancy I advised her to wait to full time and have Cæsarian section. She consented, but the labour came on nearly a month before full time.

When she sent for me I found she had been in labour a considerable time. The os was fully dilated, the membranes ruptured, the head extremely flexed, moulded to an extraordinary degree, and engaged in the brim. I had her at once removed to hospital, and after a careful examination I determined to deliver with forceps.

The head so filled the brim that I had considerable difficulty in getting the blades of the instrument in. Delivery was effected in the Walcher position. The child, a male, was alive, and weighed 7 pounds. It did well. The head was tremendously elongated in the occipito-frontal diameter. There was no depression of the skull. The mother made a good recovery.

Antero-posterior Contraction—Flat Rickety Pelvis.—In this condition the pelvis is flattened from before backwards—*i.e.*, the promontory is pushed forwards, and the pubis backwards. The conjugate diameter at the brim is decreased, while the transverse one is increased. The brim is kidney-shaped, and its inclination is increased. The iliac bones are thickened and flattened out, so that the interspinous diameter, instead of being an inch shorter than the intercristal, is equal to it, or even greater. The sacrum is flatter than in an ordinary pelvis, the ischial tuberosities farther apart, and the pubic arch is wider. The outlet is therefore increased in size. The contraction lies at the brim in the antero-posterior diameter, and it is there difficulty arises. Let the head once pass the brim and there will be no difficulty at the outlet.

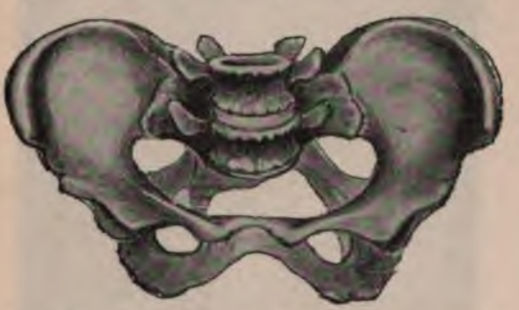

FIG. 27.—FLAT RICKETY PELVIS (FOTHERGILL).

In the great majority of cases flattening of the pelvis is due to rickets in infancy, but occasionally a non-rachitic flat pelvis is seen, due to some peculiarity in development, as no trace of rickets or other disease can be found. As already stated, we sometimes have more or less flattening from rickets in a generally contracted pelvis.

Rickets is a disease of the first and second years of life. The cartilaginous elements from which the bones are developed grow rapidly, but at first there is a want of deposition of the mineral constituents, and the bones remain very soft, and any mechanical force applied to them will cause bending. This is quite evident in the arms, legs, and spine, but the same thing happens in the pelvis. The weight of the body is transmitted as a downward force along a line which passes through the promontory of the sacrum. The force is transmitted from the sacrum to the pelvis, and then to the ground through the acetabula

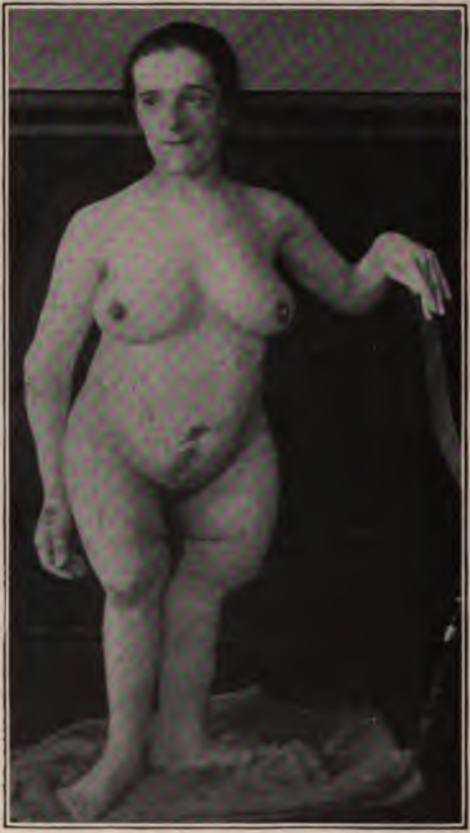

FIG. 28.—DEFORMITY FROM RICKETS. FLAT PELVIS: CÆSARIAN SECTION.

and legs in standing or walking, or through the ischial tuberosities in sitting. While the child is sitting, the downward force is partly spent in acting in the plane of the brim, and this tends to force the promontory forwards—*i.e.*, to shorten the brim antero-posteriorly, and necessarily to widen it transversely. In the same way, sitting tends to widen the outlet. In standing, the upward pressure through the acetabula tends to force the sides of the pelvis inwards, and thus to narrow it transversely. As a rule, a rickety child cannot walk while the pelvis is soft, but in the disease osteomalacia, which is one of adult life, the bones become very soft, and we have this forcing in of the sides of the pelvis. In some cases, however, the rickets occur when the child is walking, and we then have the acetabula forced in, giving rise to the triradiate or pseudo-malacosteon pelvis. If there is much lateral curvature of the spine, the weight of the body will be thrown to one side, and that side of the pelvis will be pressed in, giving rise to the scolio-rachitic obliquely contracted pelvis. With rickets we thus find a number of different deformities of the pelvis, but the flat pelvis is by far the commonest one.

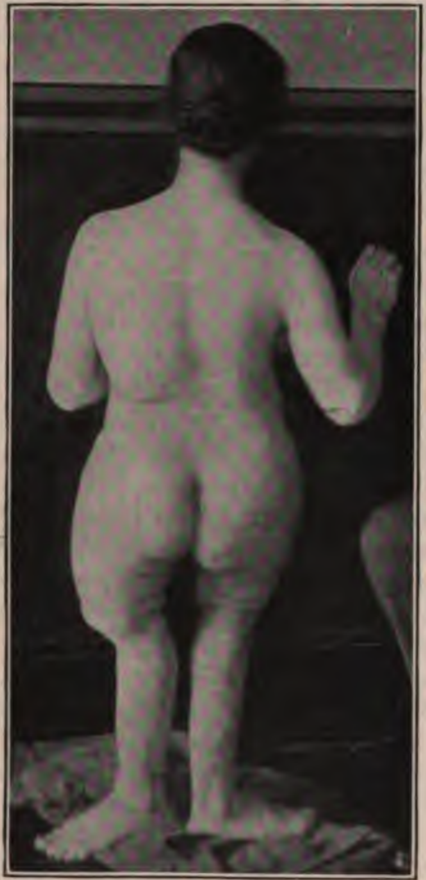

Fig. 29.—Back View of Same Case.

Diagnosis of a Flat Pelvis.—In most flat cases the patient will show indication of rickets, in deformity of the limbs, etc., and the abdomen will be very prominent. The iliac crests will be felt to be thicker and less curved than usual. The intercristal and interspinous diameters will be found to be nearly the same length. The head, if it presents, will be felt lying free above the brim, and if there is much contraction it will overlap the top of the symphysis. On making a vaginal examination, the promontory will be reached with ease, and the presenting part will be found lying above the brim. If it is the head, it will usually be lying transversely, with the anterior and posterior fontanelles on nearly the same level and the sagittal suture in the transverse diameter of the pelvis, either near the symphysis or the promontory, according to which parietal bone is presenting. The membranes are liable to protrude in a sausage shape and to rupture early.

Prognosis.—This will depend upon the amount of contraction, the relative size of the head, and the way in which it presents. If it is a case in which natural efforts can finish the labour in a reasonable time the risks should not be very great. On the other hand, if artificial interference is required, the risk to the mother will be considerably increased, and may leave little or no hope for the child, who is doomed, if a destructive operation be required.

Mechanism of Labour in a Flat Pelvis.—This differs somewhat from that in an ordinary pelvis. The head usually presents with the occipito-frontal diameter in the transverse of the pelvis. The head is not flexed, so the anterior and posterior fontanelles are on a level. It is here we see the typical parietal presentations mentioned on p. 278. The anterior parietal presentation is the most usual one (Figs. 30 and 31). The sagittal suture will be felt running transversely across the pelvis near the promontory. When the posterior parietal presents, the sagittal suture will be felt near the symphysis (Figs. 32 and 33). The biparietal diameter of the head lies in the conjugate, but this is the longest transverse diameter of the head in the shortest diameter of the pelvis. To bring the bitemporal or shortest diameter of the head into the conjugate, the fore part of the head dips a little, or extends slightly, and the head slips towards its occipital end. This is caused by the wedge shape of the head. If it is an anterior parietal presentation, the sagittal suture will be felt to pass nearer the promontory than it was when labour began, and the parietal bone will be felt coming lower in the pelvis. When it has advanced a certain distance it becomes pivoted, as it were, on the symphysis, and the posterior side of the head is gradually driven down round the promontory. The sagittal suture will now be felt to come forwards. A groove or depression may be formed by the promontory as the posterior side of the head rounds it. When the posterior parietal presents it passes down into the pelvis, the sagittal suture travelling towards the symphysis, and it gets pivoted on the promontory, and the anterior side of the head is driven round the symphysis, the sagittal suture now passing towards the centre of the pelvis. The posterior side of the head may be indented by the promontory.

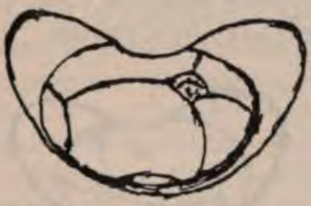

FIG. 30.—ANTERIOR PARIETAL PRESENTATION (FROM BELOW).

The rounding of the symphysis is much more difficult than that of the promontory, because the zone of resistance is greater, nearly the whole of the anterior side of the head being in contact with the anterior wall of the pelvis, while in the other case the only part of the head which is resisted is that which is in contact with the promontory.

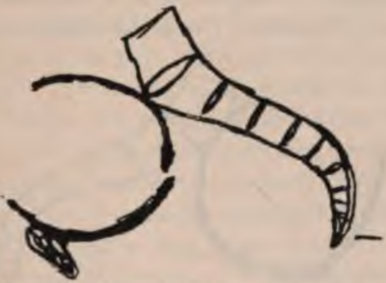

FIG. 31.—ANTERIOR PARIETAL PRESENTATION (SIDE VIEW).

These backward and forward movements of the head are similar to the movements of a cork when it is drawn from the neck of a bottle with the fingers, especially if you hold the bottle upside down. To imitate the movements in an anterior parietal presentation, first push the cork away from you; this brings the anterior side of the cork down a little, and represents the dipping of the anterior parietal bone into the pelvis. Next draw the cork towards you, and the posterior side advances, the anterior one pivoting on the mouth of the bottle; this imitates the rounding of the promontory by the posterior side of the head. To imitate the movements in the posterior parietal presentation it will only be necessary to reverse them, pulling the cork toward you first, and pushing it away from you last.

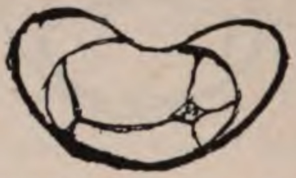

FIG. 32.—POSTERIOR PARIETAL PRESENTATION (FROM BELOW).

After the head has passed the brim the mechanism becomes much the same as in an ordinary pelvis. A certain amount of flexion will occur, and internal rotation of the occiput forwards, and extension. As the outlet is enlarged, the head will escape easily; but, as the sacrum is straighter than usual, the perineum may easily be torn.

The anterior parietal presentation is a much more favourable one than the posterior. Fortunately it is the commoner of the two.

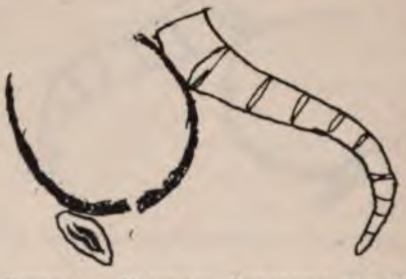

FIG. 33.—POSTERIOR PARIETAL PRESENTATION (SIDE VIEW).

In the non-rachitic flat pelvis, where the transverse diameter of the pelvis is somewhat lessened, the head cannot extend or slip towards its occipital end; it becomes extremely flexed, and passes down, as in a generally contracted pelvis. The posterior parietal bone will be grooved in a more or less longitudinal direction as it passes the promontory.

Treatment.—This will depend upon the amount of contraction and the relative size of the child's head. If the true conjugate is 2¾ inches or less, there will be little hope of getting a live child through unless the head is very small. If the child is alive, Cæsarian section should be done as soon as the os is dilated sufficiently to admit a finger. If the conjugate is under 2 inches Cæsarian section should be done, even if the child is dead, unless, indeed, it is macerated. If the conjugate is from 3 inches to 3½ inches, and the head is not very large, delivery of a live child may be possible, either by forceps or turning, placing the patient in the Walcher position while bringing the head through the brim. Symphysiotomy is a very suitable operation in such cases. If the child is dead craniotomy should be done. At the present day one is rarely justified in doing craniotomy on a live child, unless there are strong reasons against either Cæsarian section or symphysiotomy.

When the case is first seen one should decide as soon as possible on the method of delivery. If it is to be Cæsarian section the sooner it is done the better, before the woman becomes exhausted. If the case be under observation, I would do the operation before the actual pains set in—*i.e.*, as soon as the cervix is taken up and the os will admit a finger. If it is decided to deliver through the natural passages, the membranes should be preserved as long as possible. If they rupture early, as they are apt to do, dilatation will be hindered, and in many cases will have to be done artificially, either manually or by the use of Champetier de Ribes' or Barnes' bags. The bags are most useful in these cases, as they retain a certain amount of the liquor amnii in the uterus. The second stage should be allowed to go on for several hours, if there is a chance of the labour being finished by natural efforts, or if you have decided to use forceps. The patient, however, must be watched carefully, especially if the pains are strong, and on the first indication of thinning out of the lower uterine segment and the appearance of Bandl's ring, steps must at once be taken to deliver by forceps, symphysiotomy, or craniotomy, but never by version. If version is decided upon, it should be done at the beginning of the second stage, and never when the uterus is firmly retracted round the child.

How to test the Size of the Head relative to the Size of the Brim of the Pelvis.—The size of the brim of the pelvis can be very easily estimated by the methods already described, but how are we to estimate the size of the head? A cephalometer has been devised by Perret for this purpose. It can only be applied to the head through the abdominal wall, and the only diameter of the head which can be measured in this way is the occipito-frontal one, a diameter which is of very little importance. The important diameter for one to estimate in a flat pelvis is the biparietal, and it cannot be measured by a cephalometer. It has been shown that the biparietal diameter is approximately 1 inch shorter than the occipito-frontal, but this is only an approximation. The best method of judging whether or not the head will pass through the brim is by actually testing how far it can be made to engage. By this method you are also able to estimate whether or not the head is likely to mould much. We have used it for some time in the Maternity Hospital, and it has recently been described by Dr. Munro Kerr.

It can be done without anæsthetizing the patient, but it is better to have her under chloroform. If the head is not presenting it should be manipulated into the brim by external version. With the patient in the lithotomy position, pass the fore and middle fingers of the hand into the vagina, and bring the thumb up over the front of the symphysis pubis ; then grasp the head through the abdominal wall with the other hand, and press it downwards and backwards into the brim. By the fingers in the vagina you will be able to estimate the amount of engagement and also the hardness or softness of the head, while with the thumb over the symphysis you can judge of the amount of overlapping (Fig. 34). If the head can be pushed well into the brim you may be quite sure it will come through. If, on the other hand, it cannot be made to engage, and there is considerable overlapping, delivery in the ordinary way will be impossible, and you will have to decide whether a symphysiotomy or a Cæsarian section will be necessary. Experience alone will enable you to decide which of these operations should be done.

Forceps versus Turning.—At one time turning was almost invariably done in flat pelves in preference to delivery by forceps, but since axis-traction instruments have come into use they are much more frequently used than the older forms were. There are certain cases in which turning will give the best chances of getting a live child through, while there are others in which, I believe, axis-traction forceps are preferable. If the pelvis is wider towards one side than the other, and if, by turning, you can bring the head through that side, then manifestly turning is preferable to forceps. Anterior parietal presentations are the ones which are most suited for forceps, just as they are the ones in which natural delivery most frequently occurs. Posterior parietal presentations, on the other hand, are not suitable for forceps delivery, and, if possible, version should be done as soon as the os is fully dilated, and before the uterus has retracted round the child. In all cases the Walcher position should be adopted while the head is passing the brim. In forceps deliveries, after the head has passed the brim the instruments should be taken off and reapplied to the sides of the head, as the first grip will necessarily have been antero-posterior as regards the head. Care must be taken of the perineum, as it may very easily be torn. Antero-posterior forceps have been devised for these cases. The blades are applied to the sides of the head, and lie antero-posteriorly in the pelvis, but I do not think they are as useful instruments as the ordinary axis-traction ones. For one thing, it is impossible properly to apply the axis-traction principles to them. They are very powerful instruments, and mischief may be done with them.

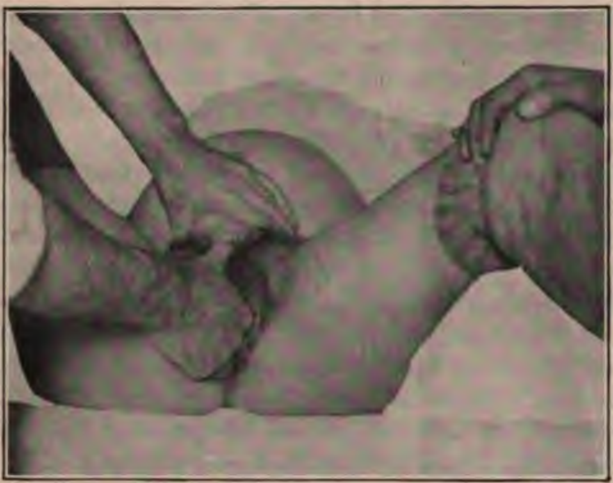

FIG. 34.—METHOD OF TESTING THE SIZE OF THE HEAD RELATIVE TO THE SIZE OF THE PELVIC BRIM.

Reasons why Forceps should be used in Anterior and Version in Posterior Parietal Presentations.—Recall the mechanism of labour, and you will at once see that in an anterior parietal presentation the action of the forceps will exactly carry out the natural movement of the head by swinging it forwards on its pivot on the symphysis, thus bringing the posterior side past the promontory. On the other hand, in a posterior parietal presentation the pivot is on the sacrum, and the natural movement is a backward swinging of the head, which cannot be carried out with the forceps. In fact, the forceps will carry the head in the opposite direction. I therefore maintain that in posterior parietal presentations version should be done, if the uterus is not moulded round the child. If there is any risk of the uterus being ruptured by the operation, symphysiotomy should be resorted to, and this will allow of delivery by forceps. The two following cases will illustrate the truth of this contention :

CASE I.—Mrs. B., 2-para, aged twenty-nine. This patient's first pregnancy was a somewhat interesting one. I first saw her in 1900 at the seventh month, and could not detect any signs of fœtal life. After examining her several times I concluded the fœtus was dead. The patient was anæmic, but beyond that her health was good. She was very anxious to have the uterus emptied, but I strongly advised her to wait. She went to full time, and a seventh-month, somewhat macerated, fœtus was born quite easily. She made a good recovery.

The present labour was at full time. When I was called the membranes had ruptured. The os was about half dilated. The head, which was large, lay above the brim transversely, the occiput towards the left, and with the sagittal suture in front of the centre of the pelvis, near the symphysis. The two fontanelles lay on about the same level. It was thus a typical posterior parietal presentation. The pelvis was very broad and slightly flattened. The true conjugate was barely 4 inches. An ordinary-sized head should have given no difficulty with so large a conjugate, but it was quite evident that the head was above the average size, and after delivery this was seen to be the case. The symphysis was slightly overlapped.

As the uterus was not retracted round the child, and the fœtal heart was quite strong, I determined to wait for some hours to allow of full dilatation of the os and moulding of the head. Seven hours after the rupturing of the membranes the head had not advanced at all, although the uterine contractions had been fairly strong. As the contractions were now becoming weaker, I determined to deliver, as it was quite evident this would not occur by natural efforts. Dr. Louise M'Ilroy kindly assisted me.

As the uterus was not retracted round the child, I determined to try first with forceps, and if I failed, to do version. I am very strongly of opinion that version should not be done after failure with forceps—*i.e.*, after a lengthy trial of forceps—but this case did not come under that heading, and I was confident that the patient would not suffer.

I applied a very considerable amount of traction, but, as I expected, did not advance the head in the least. I then removed the instruments and turned without any difficulty. Dr. M'Ilroy kept up firm suprapubic pressure, and the arms were easily released. The vagina was so narrow that the perineum was ruptured about half-way back by my hand in releasing the arms. The after-coming head was delivered by traction and suprapubic pressure. The child was asphyxiated, but began to gasp in a minute or two, and did not require artificial respiration. It was a large, healthy male, and weighed 8½ pounds. Its head was considerably above the average size, but there was no mark of the promontory upon it. The perineum was stitched, and healed completely. The patient made a good recovery.

Case II.—Mrs. B., 7-para, aged thirty-eight. Diagonal conjugate, 4 inches; true conjugate, 3¼ inches. I had attended this patient in three previous confinements. The first was at full time, breech presentation. The child was born alive, but with a deep indentation of the temple. The next two deliveries were by induction of premature labour at the eighth month, and these deliveries were very difficult. She had suffered so much at her deliveries that it was thought advisable to do Cæsarian section and sterilize her. Labour, however, came on at the end of the eighth month by the rupturing of the membranes. On admission the fœtal heart could be heard to the left and below the umbilicus, and the head was lying free above the brim. The os was partially dilated, and there was a free discharge of blood. A careful examination revealed a marginal placenta prævia. As the patient had not reached full time, and as the head did not markedly overlap the symphysis pubis, I decided to deliver through the natural passages. The os was at once completely dilated by means of the fingers and forceps applied. The head lay in the transverse diameter of the pelvis, but it was impossible to say which parietal bone would first enter the brim. Traction was applied in the Walcher position, and the head made to engage, but it would not pass the brim. The forceps were removed, and I found the presentation was a typical posterior parietal one. As the uterus was not retracted round the child, version was easily accomplished. The after-coming head was delivered by suprapubic pressure and traction without any difficulty. The child, a female, was alive, and weighed 7 pounds. Both mother and child did well. The mother was much disappointed that Cæsarian section and sterilization had not been done.

Injuries to the Skull, etc., during Delivery.

If there has been much difficulty in delivering the head, the portion of the skull which lay against the promontory will probably be found to have an indentation. This may be a spoon-shaped depression, or an ordinary depressed fracture. The spoon-shaped depressions usually rise of themselves in a short time, but they can be elevated at once by compressing the head antero-posteriorly. This should be done at once to relieve pressure upon the brain. If it is a depressed fracture it cannot be raised in this way. The brain may be lacerated, and this will probably cause the child's death. Immediate elevation by cutting down and inserting a probe or periosteum elevator under the bone, above the dura mater, has been done successfully in a number of cases (see case, p. 530). It should be done with strict aseptic precautions. Where the child shows difficulty of breathing, elevation of the bone usually relieves it very quickly. In some cases there may be no injury to the skull, but meningeal hæmorrhages, or hæmorrhages into the brain substance, may cause the death of the child. These occur more frequently when the head has come last. If the child recovers it may develop imbecility. It is difficult to say how often imbecility may be traced to injury during birth, but I have certainly seen it follow in a marked degree in one case, and in a lesser degree in another. In the first case the delivery was by the breech. There was great difficulty in resuscitating the child, and he then began to have convulsions, which continued for thirty-six hours. These were finally checked after small doses of chloral hydrate had been repeated every fifteen minutes, until he had got 15 grains. He then slept for three days, but could be roused long enough to swallow a little milk. He is now eight years old and is an imbecile, able to say a few words and to walk with considerable difficulty. The convulsions were continuous, and so terrible that I persisted with the chloral in order to stop them at any risk. The second case I delivered with axis-traction forceps, after other instruments had been tried. I was sent for to do a craniotomy, but managed to deliver the child alive. He had no convulsions, but at the age of four he spoke with difficulty, and showed a certain amount of weakness in brain power. He will probably outgrow the condition.

Injury to the eye is sometimes caused. This may be by the blade of the forceps, or by the promontory crushing the temple and fracturing through the orbital plate. The eye may be completely enucleated.

Opacity of the cornea sometimes occurs from the pressure. It may render the whole cornea opaque, but in all cases observed by me there has been a linear, denser opacity about the centre of the cornea, usually running up and down, but occasionally transversely (see Figs. 82 and 83, p. 534). In several cases I observed this linear density immediately after the birth of the child. The condition is evidently caused by pressure. It clears up to a large extent, but the linear opacity is liable to remain. Hæmorrhages may occur into the anterior chamber of the eye, under the retina, or conjunctiva, or even into the optic nerve.

With flat pelves, as with other abnormal ones, malpresentations are common. The most frequent malpresentation is transverse. It should be dealt with by version, but this should never be attempted if the uterus is retracted round the child, as rupture of the uterus will be caused. An embryulcia or decapitation should then be done. If the face presents version should be done early, but if the face is jammed in the pelvis forceps should be tried, and if these fail, craniotomy. The most difficult face case I have ever dealt with was in a flat pelvis. The face was jammed in the pelvis transversely. The ordinary curved instruments were of no use, but I managed to deliver with straight ones. Forward rotation did not occur until the face was partially born. The flattening of the pelvis had prevented this.

The cord is very liable to prolapse in contracted pelves. It should be dealt with in the usual way.

The Pelvis of Congenital Dislocation of both Hips.—The abnormal position of the heads of the femora on the dorsa ilii causes a considerable widening of the pelvis transversely, both at the brim and outlet. The conjugate will be relatively shortened. At the outlet the tubera ischii are wide apart and the pubic angle much increased.

If the dislocation is on one side only, that side of the pelvis will be widened, and the symphysis be pulled a little towards the same side.

There is not likely to be any difficulty with the labour.

Split Pelvis.—In this pelvis there is a congenital absence of the symphysis pubis, and the bones are connected by a fibrous band. The pressure of the femora rotates the innominate bones about the sacrum, so that the posterior iliac spines approach each other. The sacrum slips forwards and downwards, and in extreme cases it looks as if the pelvis were inverted. The pelvis is flattened and widened much, as in rickets. It is usually associated with extroversion of the bladder, and therefore pregnancy is exceedingly rare. The gap in front allows of delivery without difficulty, but the perineum is usually torn.

Case of Exstrophy of Bladder and Split Pelvis Complicating Labour.—I am indebted to my friend Dr. James Adam, of Hamilton, for the notes and drawings of this case.*

"The patient as I first saw her in November, 1900, was a well-nourished woman, aged twenty-two, and about five months pregnant. In earlier years she had been told by a doctor that the extroversion might get all right when she was twenty-one. She seems to have believed and acted on this—at any rate, she got married at that age.

"Examination of the abdomen showed the following three structures from above downwards:

"1. An umbilical area of about 3 inches in diameter covered by thin, parchment-like cuticle, which hardly seemed strong enough to retain the protruding intestines, yet the hernia did not enlarge.

"2. A vesical area immediately adjoining the umbilical area above, of about the same diameter, and extending below to the tissue which replaced the pubic symphysis. This area, really a small portion of the posterior wall of the bladder, projected about 1 inch above the general surface, and shaded off at its margin into the surrounding skin, but at its inferior and most prominent part presented a raw, excessively tender mucous surface on which the ureters opened about 1 inch apart, and from which tiny jets of urine occasionally spurted over the parts below (there was not a continuous forceless trickle). Gentle pressure just above the ureteral orifices would sometimes cause a spurt of urine, so that evidently there was a small ampulla of each ureter just above its orifice.

"3. Below the vesical area, and separating it from the vaginal orifice, was a very firm fibrous band uniting the gap between the pubic bones. This gap measured 3⅜ inches. The lower end of the recti muscles seemed to be attached to the bones and not to fascia, and converged upward to the middle line above the umbilical area.

"Separating the lower part of the median area described above from the thighs were the labia majora. These were large and diverged upwards. Just inside them inferiorly were the enlarged œdematous nymphæ. The left was specially œdematous and pendulous, almost hanging between the thighs. The vaginal orifice was surrounded by a soft fringe of mucous membrane, and with difficulty admitted two fingers. The os uteri was within 1 inch of the orifice, the anterior fornix being easily reached in front of the os, but the posterior fornix lay much deeper, say 2½ inches. This greater depth seemed due to the perineum being larger and thicker than normal, for otherwise the vagina was decidedly short. I could make out no trace of the clitoris. The patient during the day wore a rubber urinal, at night lay on pads. Previous to conception menstruation had always been easy and regular every four weeks. For the greater part of the last three months of pregnancy she had to be in bed, owing to œdema of the labia minora and threatened prolapse of the uterus.

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* Dr. Adam has published notes of this case in the October number (1902) of the *Journal of Obstetrics and Gynæcology of the British Empire.*

"I was called in to her on March 31, and found decided uterine contractions, but the cervical canal still quite distinct. The temperature was 103·5° F., and had evidently been up for some days previous, as malaise, loss of appetite, and a feeling of feverishness had existed for about a week. Also she had had three hours of uterine pains the previous day. I gave her a morphia suppository; the pains ceased, and the patient slept. Next morning, April 1, she felt fairly well, and the temperature was 100·2° F., but at 4 p.m. and 9 p.m. was 104° F., notwithstanding quinine and salol. Labour began at 11 p.m., and at 3 a.m., April 2, I found the membranes tense and protruding at the vaginal orifice. The long tough perineum, and possibly the pubic gap, caused the head to pass unusually well forward, and a healthy female child weighing probably 6 pounds was soon born. The anterior part of the perineum and also the soft fringe round the vaginal orifice were torn. The membranes were adherent at the fundus; I had twice to insert my hand to remove them. For this reason. and considering that the bruised, lacerated parts were constantly bathed in urine, that the patient had a high temperature, and that her mother and only sister died in childbed, I gave an intra-uterine douche of weak carbolic in boiled water, stitched the perineum, in order, if possible, to cover the os, dusted with aristol, and applied a bichloride dressing. At 11 a.m. the temperature was 97·2° F., at 8 p.m. 101·5° F.

"The following day (second of puerperium) the temperature at noon was 103·3° F., the parts round the vaginal orifice black and sloughy, the cervix presenting here, and its superficial parts sloughing; abdomen distended. Vaginal douche (weak bichloride), boric wool substituted for the bichloride dressing, salol and calomel internally. Third day of puerperium: Temperature at 11 a.m., 95·5° F.; at 9 p.m., 99·5° F. Bowels moved twice, os and cervix projecting about 2 inches beyond vaginal orifice, and covered with dark superficial slough.

"After this the temperature kept subnormal, but vaginal douching was continued till the sloughs separated about the sixth and seventh days. For a time the patient's chance seemed small : high temperature, abdomen distended, the thin, parchment-like umbilical area ballooned out with intestine, the margin of the vaginal orifice sloughing, and, together with the superficially sloughing and exposed cervix, being constantly bathed in urine. To my surprise, the perineal stitches held, and the wound healed in greater part. I failed to make out the exact cause of the pyrexia, which was even more marked before than after labour. Possibly constipation, which was troublesome, had something to do with it. For this reason salol, calomel, and saline purgatives were given.

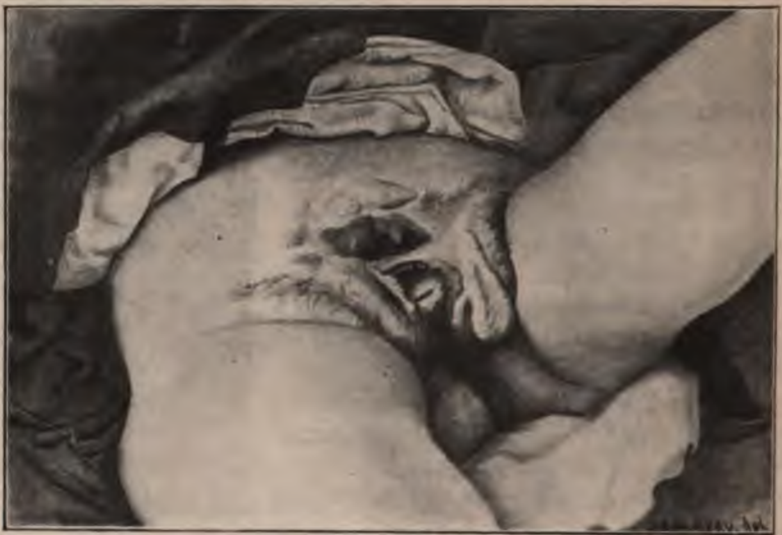


FIG. 35.—EXSTROPHY OF BLADDER AND SPLIT PELVIS (ADAM).

"It is to be noted, whereas Klein says that in most of the seven labours complicated by exstrophy of the bladder as tabulated by him the perineum gave trouble, and required incision, there was no need for operative interference in this case, although the perineum was long and tough. The somewhat small size of the child may account for this. As involution proceeded, the cervix gradually receded till it came to lie just at the vaginal orifice. Prolapse, of course, now occurs with the erect posture, but the womb is easily kept up by a rubber cup and stem pessary, which the patient wears in addition to her rubber urinal. She was seen by Dr. R. H. Parry with a view to operation for the extroversion, but this she in the meantime declines.

"A photograph was taken on the fifth day, from which, and from an examination of the patient, at much trouble to himself, my friend Dr. John Lindsay, of Glasgow, has made the accompanying excellent drawings."

Spondylolisthetic Pelvis.—In this condition the last lumbar vertebra has partly slipped down in front of the promontory, and thus partially blocks the brim. This may be the result of sudden or continued strain, when the body of the last lumbar vertebra has not ossified properly, or has become weakened by caries. If the last lumbar vertebra is defective, and the person goes about, and especially if she attempts to do heavy work, the downward pressure will cause the body to slip forwards gradually, or suddenly. The body of the vertebra forms a blunt wedge, with its base in the brim of the pelvis. It becomes ossified in its new position, and the new bone formation further blocks the rim.

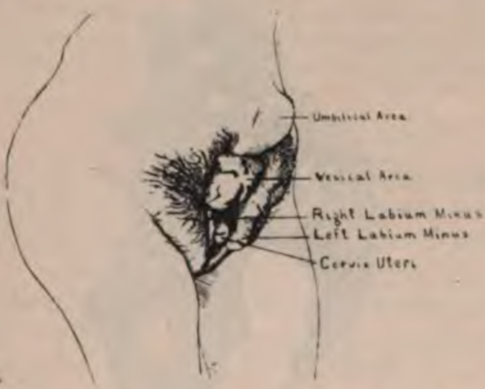


FIG. 36.—EXSTROPHY OF BLADDER AND SPLIT PELVIS: SEMI-PROFILE VIEW IN OUTLINE (ADAM).

The effect upon the sacrum is to displace its upper part backwards, and bring the lower part and the coccyx forwards. The backward pressure of the sacrum separates the iliac bones, and widens the distance between the posterior superior iliac spines. The inclination of the pelvis to the horizon is diminished, and increased strain is thrown upon the ilio-femoral ligaments, and the upper part of each innominate bone is pulled outwards, while the lower part goes inwards. The transverse diameter of the pelvis is thus widened at the brim and narrowed at the outlet. At the brim the conjugate is lessened and the transverse increased, while at the outlet the conjugate and transverse are both lessened.

The patient's body is deformed. The spine is shortened, and there is great lordosis. In a bad case the lower ribs will be found sunk into the false pelvis. The patient walks with very short steps, and the feet are slightly inverted.

Diagnosis.—From the history and external appearance of the woman one may form a pretty accurate notion of the deformity. A vaginal examination will reveal that the conjugate at the brim is narrowed by the projecting forwards of the last lumbar vertebra.

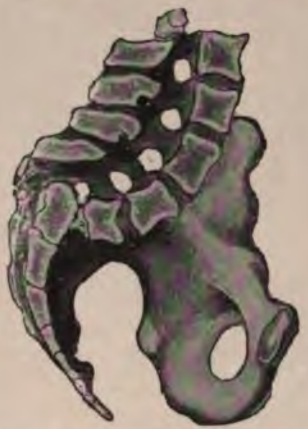


FIG. 37.—SPONDYLOLISTHETIC PELVIS (FOTHERGILL).

This false promontory will be very easily reached. At the outlet the ischial tuberosities will be found closer together than in a normal pelvis, and the sacrum and coccyx will project well forwards. The condition at the outlet is the same as that found in a kyphotic pelvis.

Prognosis.—It is a more serious deformity than a flat pelvis with an equal contraction at the brim, because the outlet is also contracted.

Treatment.—This depends upon the degree of deformity, which can be estimated by the length of the conjugate. The shorter this is, the greater will be the deformity at the outlet. Artificial delivery will, as a rule, be required. Much the same methods have to be adopted as with flat pelves, so that the rules already given for dealing with the latter cases apply to these also.

CHAPTER XXII

CONTRACTED PELVES—*Continued*

Compressed Pelvis—Malacosteon or Osteomalacic Pelvis—Pseudo-malacosteon Pelvis—Transverse Contraction—Kyphotic Pelvis—Robert's Pelvis—Infantile Pelvis—Funnel-shaped or Male Pelvis—Oblique Contraction—Scoliotic Pelvis—Naegele Pelvis—Coxalgic Pelvis—Obstruction from Tumours of the Pelvis—Sarcomatous Enchondroma of the Pelvis (Case).

COMPRESSED PELVIS.

Malacosteon or Osteomalacic Pelvis.—Osteomalacia is a disease rarely seen in Britain, but it is endemic in certain parts of Europe and in hot climates. It produces extreme softening of the bones, and, as it occurs in adults, the pressure of the body-weight and the pull of the muscles will cause excessive deformity of the pelvis. When standing, the body-weight presses the promontory forwards, and the upward pressure through the acetabula forces the sides of the pelvis inwards. When sitting, the pressure upon the ischial tuberosities forces them inwards, and the sacrum doubles upon itself. The pubes give way and bend inwards at the thin part of the superior rami, and the sides of the arch also approach, thus forming the rostrum or beak. In the false pelvis the iliac bones bend and assume a scoop shape. The inlet of the pelvis assumes a **Y** or triradiate shape, hence the name triradiate pelvis. From the projection forwards of the rostrum, the true conjugate may not be much, if at all, shortened, but the available portion of it—*i.e.*, from the back part of the rostrum to the promontory—may be exceedingly short.

This description does not apply to all osteomalacic pelves. In some, the doubling-in process may be much greater on one side than the other, if the bones are not symmetrically softened, or if, for any reason, greater weight be thrown on one side of the pelvis than on the other. In such a case obliquity will be added to the deformity.

Diagnosis.—The disease is accompanied by severe pain, especially in movement. The other bones besides the pelvis suffer, so the spine bends. The patient suffers from severe muscular cramps, and probably suffocative attacks, shortness of breath, and cough. On making an examination, the bones will be found to be tender and soft. The deformity will be easily recognised, and it may be possible to force the bones apart with the hand. In a case where the actual disease has occurred prior to the pregnancy, the bones may have become hardened in their abnormal shape, and then you cannot separate them.

Treatment.—If the disease is active and the bones are soft, the pelvis may be sufficiently opened up by the hand to allow of delivery, and this should be tried. If this is impracticable, an abdominal section should be done. If an ordinary Cæsarian section is done, the ovaries should be removed, as this will check the disease; but it is preferable to remove the uterus and ovaries by Porro's operation, or any of its modifications.

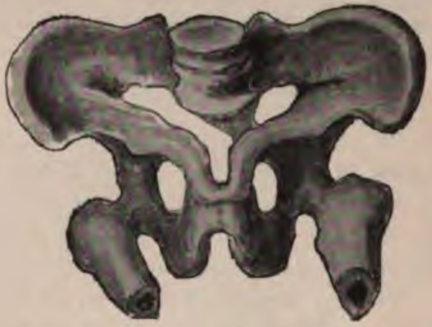


FIG. 38.—MALACOSTEON PELVIS (FOTHERGILL).

Pseudo-malacosteon Pelvis.—The deformity very much resembles that of the true malacosteon pelvis, but is not so great. It is caused by pressure acting on the softened pelvis, but the softening in this case has been due to late rickets, occurring when the child was running about. The false pelvis will show some of the characteristics of the rickety flat pelvis, as the iliac bones will not be crumpled in, but flattened out so that the iliac spines will be far apart.

Treatment.—In an extreme case Cæsarian section should be done. Removal of the ovaries or uterus is not necessary, as the disease would not be benefited. If it is considered advisable to sterilize the patient, the tubes should be tied and cut. In slight cases delivery may be possible by forceps or turning. The bones are quite fixed, and it will be impossible to widen the passage as in true malacosteon.

TRANSVERSE CONTRACTION.

Kyphotic Pelvis.—In kyphosis, or angular curvature of the spine, there must be a compensatory curve, or the body would fall forwards. When the angular curvature is high up in the spine, the compensatory curve in the lumbar region will cause great lordosis. This will not alter the shape or size of the pelvis, but it will have an adverse influence on labour by causing deviation of the uterine axis. When the curvature is low down a change in the inclination of the pelvis gradually takes place, and its shape is altered. The lower lumbar and upper sacral vertebræ are drawn back, thus increasing the conjugate and relatively shortening the transverse diameter.

The iliac bones are straightened, and the anterior superior spines thrown apart.

The true pelvis becomes funnel-shaped. The outlet is shortened antero-posteriorly by the tilting forwards of the lower end of the sacrum and coccyx, and markedly so, transversely, by narrowing of the pubic arch and turning in of the ischia. We thus see that the main contraction is at the outlet, and it is there the chief obstruction will be met with in delivering.

Diagnosis.—The sharp, angular curvature of the lumbar spine will suggest the condition. The promontory will be very difficult to reach, but the contraction at the outlet will be easy to make out.

The mechanism of labour in the upper part of the pelvis is much as in an ordinary pelvis. The occiput may be turned forwards before it reaches the floor of the pelvis, the rotation being caused by the bones of the pelvis, if the deformity is not marked, but if there is marked narrowing of the pubic arch, it cannot turn forwards, as there is not room for it. It then passes behind the ischial tuberosities, and, if it be small enough, will be expelled in an oblique diameter, pressing strongly against the coccyx, which may be broken. The perineum is very apt to be torn.

Treatment.—The difficulty will be at the outlet, and forceps will usually overcome it. Turning is not suitable. If forceps fail, and the child be still alive, symphysiotomy may be tried. Craniotomy would, perhaps, be preferable, and induction of labour in subsequent pregnancies is to be recommended. Except with very extreme contraction at the outlet, Cæsarian section is not necessary.

Robert's Pelvis.—This is an exceedingly rare deformity of the pelvis. Both sacro-iliac joints are ankylosed, and the wings of the sacrum are wanting. The iliac bones are straighter than in an ordinary pelvis. The promontory is pushed slightly forwards. The brim is thus markedly contracted in the transverse, and slightly in the conjugate, diameter. At the outlet the tuber ischii are inverted and the pubic arch narrowed.

Diagnosis.—By external and internal measurements, the condition can be easily recognised.

Treatment.—The delivery of a live child through the natural passages is impossible, therefore Cæsarian section should be done.

Infantile Pelvis.—In these cases the pelvis is long in the conjugate, but narrowed transversely, and funnel-shaped in the cavity. The fœtal type has been maintained. The genital organs will be defective in development, so that pregnancy is not likely to occur.

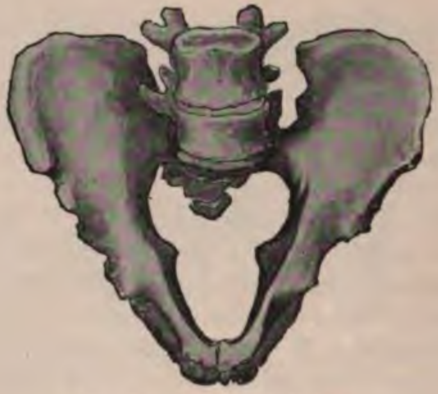


FIG. 39.—ROBERT'S PELVIS.

Funnel-shaped or Male Pelvis.—In this form the pelvis develops in the shape of a male pelvis. It is deeper and somewhat narrowed transversely, especially at the outlet. The sacrum is longer and narrower than usual, and the promontory higher. The difference between the diagonal and true conjugate may be an inch, or even more.

Diagnosis.—This can only be made by careful internal measurements. The chief contraction will be found at the outlet in the transverse, and this diameter is exceedingly difficult to estimate.

Treatment.—The chief difficulty will be at the outlet. Forceps will generally overcome this, and if these fail and the child is alive, symphysiotomy can be done, or, in the last resort, craniotomy. In subsequent pregnancies induction of labour will be advisable.

OBLIQUE CONTRACTION.

Scoliotic Pelvis.—Lateral curvature of the spine will cause an oblique contraction of the pelvis by the greater part of the body-weight being thrown upon the side of the pelvis towards which the curvature lies. This side of the sacrum is driven upwards, and the pressure upwards through the acetabulum, when the patient stands, pushes that side of the pelvis inwards. The pubic symphysis is pushed towards the opposite side. The ischial tuberosity of the contracted side is everted. The oblique diameter, measured from the contracted side to the opposite sacro-iliac joint, is considerably shortened at the brim. The other oblique diameter is considerably larger.

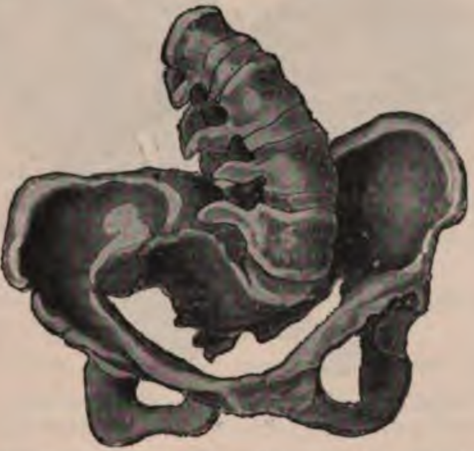


FIG. 40.—SCOLIO-RACHITIC PELVIS (FOTHERGILL).

As scoliosis is generally associated with rickets, there is likely to be more or less flattening of the pelvis as well, giving the **scolio-rachitic pelvis.**

Diagnosis.—Lateral curvature of the spine, especially in a rickety subject, will at once suggest the deformity, and an internal examination will confirm the diagnosis.

Treatment. — In slight cases there may be no difficulty in the delivery. In some cases forceps may succeed, but, if the deformity is at all marked, Cæsarian section should be done. Induction of labour may be done in some cases. Symphysiotomy is not applicable.

Naegele Pelvis.—This is a typical obliquely contracted pelvis, due to defective development of one wing of the sacrum and ankylosis of that sacro-iliac joint. It is a developmental condition, and not due to disease, but a somewhat similar condition may be brought about by disease in infancy, causing ankylosis. It is the same condition as is found in Robert's pelvis, but, in the latter, both sides of the sacrum are affected and the contraction is symmetrical. The weight being thrown upon the defective side increases the deformity. The pubic symphysis is pushed over towards the sound side.

Diagnosis.—The iliac crests will be found asymmetrical and the symphysis pushed beyond the middle line. By a careful internal examination the asymmetrical shape of the pelvis can be made out.

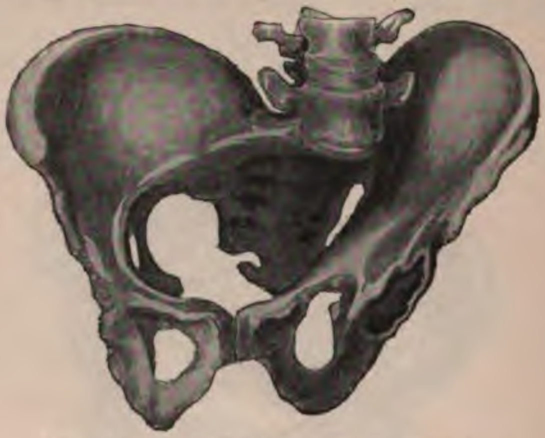


FIG. 41.—NAEGELE PELVIS (FOTHERGILL).

Treatment.—If the head is small it may come through the wide side of the pelvis much flexed, as in a generally contracted pelvis, but forceps are likely to be required. Turning is not applicable, neither is symphysiotomy. Embryulcia or Cæsarian section should be done when the child cannot come through. Induction of premature labour about the seventh month may give good results.

Coxalgic Pelvis.—Disease of the hip-joint in childhood will cause deformity of the pelvis by interfering with the nutrition of the bones of the diseased side, also by the non-use of that leg, and often dislocation of the femur. There may also be a considerable amount of new bone formation, encroaching upon the pelvic canal. The amount and nature of the deformity will depend upon the severity of the disease and the age at which it affects the patient.

Before attempting to deliver, a most careful estimate of the condition must be made by internal examination. It is not sufficient to estimate the conjugate alone, but the side corresponding to the diseased hip must be very carefully examined.

Obstruction from Tumours of the Pelvis.—Various bony tumours may affect the pelvis and cause serious obstruction to labour. These may be simple or malignant. The simple may be exostoses, single or multiple; masses of callus, as in cases of old-standing hip-joint disease, or after fractures of the pelvis; the result of rheumatoid arthritis; or ossification of the insertions of ligaments and tendons. The malignant may be of a cancerous nature, but, more frequently, sarcomatous.

The amount of obstruction will depend upon the size, number, and situation of the tumours. The brim is the part most liable to be affected. The malignant tumours are the ones most likely to cause serious obstruction, as they grow very rapidly during pregnancy. They may cause the death of the patient during pregnancy. The simple ones will not influence the pregnancy, but they may seriously affect the delivery.

Prognosis.—With a malignant tumour the prognosis is hopeless for the woman. It will at the best be only a question of time. She may live some time after delivery, but it cannot be long. With simple ones, the risk to the woman is much less.

Diagnosis.—This can only be made by careful exploration of the pelvis both by the vagina and the rectum.

Treatment.—If there is room for the child to pass, delivery may be effected by forceps, but if the projections are at all sharp, one must be exceedingly careful, lest the cervix or lower part of the uterus be perforated. If there is any risk of this, or no room for the child to pass, Cæsarian section should be done, if the child is alive, or craniotomy if it is dead. Induction of labour may be suitable in some cases.

Sarcomatous Enchondroma of the Pelvis.—Mrs. H., 1-para, aged twenty-nine, was sent into hospital about the seventh month of pregnancy. Her health had been good previous to conception, except that she suffered for two years, particularly during the winter, from pain of an intermittent character in the back of both thighs. She had been married nine years, but had never before been pregnant. When three months pregnant, the pains in the thighs became worse, and about three months later the right thigh began to swell. With the onset of the swelling, the pain in the right thigh became much more severe. The swelling of the thigh gradually increased until, after six weeks, she had to take to bed. Since then the swelling had gone on increasing, and at times the pain had been almost unbearable. For some time she had only been able to lie on her left side, and occasionally on her face. A pressure sore had formed over the left trochanter. The patient had lost considerable flesh.

Condition on Admission.—The patient was pale and emaciated. She complained of severe pain in the back of the right thigh and in the right side of the abdomen. The right leg was enormously swollen and œdematous, more especially the thigh and hip. The swelling extended up as high as the iliac crest behind, and in front it could be felt in the abdomen above the iliac crest, almost half-way up to the umbilicus. This swelling was quite distinct from the uterus, and was apparently attached to the ilium. It was particularly tender in the right inguinal region. The uterus was displaced towards the left side, and quite free from the tumour. The head of the child could be palpated, lying to the left, just above the pelvis. The fœtal heart-sounds were easily heard—strong, but rather rapid. The labia were free of œdema. On attempting to pass the finger into the vagina, the passage was found to be obstructed by a hard globular mass, growing from the right of the pelvis. The pain was so great that an anæsthetic had to be administered, to allow of a thorough examination. The tumour was found to occupy the greater part of the pelvic cavity, growing from the right side, apparently from near the sacro-iliac joint. The finger was with difficulty introduced past the mass, but the cervix could not be reached. The vaginal mucous membrane was freely movable over the mass, which at some points was soft and almost fluctuant, and at others quite hard. A rectal examination confirmed the observations made *per vaginam*. A small, hard nodule, evidently a fibroid, was made out in the anterior uterine wall near the fundus. On passing the catheter, it went in obliquely towards the left.

My *diagnosis* was, that we had to deal with a sarcomatous tumour springing from the right side of the pelvis. It was evidently growing very rapidly. To get an idea of the rate of growth, we questioned the husband, and he informed us that he had last had connection about three months ago, and that for a month previous to that he had occasionally experienced some difficulty, but never previous to four months ago.

The *prognosis* was hopeless as regards the mother. The child was still alive, but, as the pregnancy had barely reached the seventh month, it was very doubtful if an immediate Cæsarian section would give a viable child. I therefore decided to wait as long as possible, and then do a section.

The consulting staff of the hospital generally agreed with the diagnosis, and proposed treatment, but two suggested the possibility of the tumour being simple.

The patient was made as comfortable as possible by the use of opiates and keeping the bowels cleared. There was a slight trace of albumin in the urine.

It was quite evident that the tumour was steadily growing, as the swelling of the leg increased, and the vulva became œdematous. On the ninth day after admission I determined to do Cæsarian section. The fœtal heart could not be heard on the evening before the operation, but it had been quite distinct before that.

The operation was done in the usual way. The abdominal wall was very œdematous, and the veins in it much engorged. The placenta lay beneath the uterine incision. The child was quite dead. Its head showed some moulding from the pressure of the tumour. When the placenta and membranes were removed, there was a considerable amount of decidua in the uterus, which was swabbed out. The cervix was found to be patent enough to allow of drainage, so it was decided to stitch the uterus and leave it. It was fortunate this could be done, as any attempt at its removal would have caused excessive hæmorrhage. A small fibroid tumour was removed from the edge of the incision. The uterus was flabby, but there was very little bleeding. A hypodermic of ergotin and strychnine was given, and a saline infusion under the breast. The tumour was observed to block the pelvic cavity, and to extend up the right side of the abdomen, to about the level of the umbilicus anteriorly. The upper part was rounded and quite soft. It was completely retroperitoneal, springing from the right side of the pelvis. The broad ligament was opened up by it from behind.

The operation was finished by stitching the peritoneum and then the abdominal wall.

The patient rallied from the operation, but, towards the evening, cardiac failure began to manifest itself, and she died twenty-four hours later. At the time of operation the temperature was 102·4° F. It had been normal the evening before.

The post-mortem examination was done by Dr. Carstairs Douglas, who reported as follows :

"The right labium majus was enormously swollen and engorged, the left little affected. There was also some œdema of the abdomen and groin in the right iliac region. On the right side the abdomen was more prominent in its lower part than on the left, and on palpating it felt distinctly more resistant.

"The thorax presented nothing of note. On opening the abdomen and carrying the incision through the wound, some serous fluid of a straw colour escaped. The parietes at the wound were rather soft, pulpy, and œdematous. There was no pus present. There was commencing slight adhesion between the uterus and the parietes. The peritoneum appeared quite normal. The uterus was lying well up in the abdomen, the fundus as high as the umbilicus. On its anterior, and upper part was a firmly sutured wound about 5 inches in length. The tubes and ovaries were healthy; the right ovary slightly enlarged. The bladder was moderately full.

"On reflecting the abdominal parietes it was at once apparent that the right half of the false and true pelvis was filled with a large pathological mass. This was rounded and nearly smooth on its superior, anterior, and inner aspects. The upper part was of a bluish tint, and felt soft and boggy. Its lower part was firmer and more flesh-tinted. It lay beneath the peritoneum on the posterior abdominal wall and pelvis.

"The dimensions were as follows:

"1. Superiorly it rose to the tip of the eleventh rib, and slightly above the umbilicus (about the level of the second lumbar vertebra).

"2. Anteriorly it grew forwards sufficiently to make a prominence in the right iliac region.

"3. Internally it reached the middle line at the level of the promontory of the sacrum; above this it gradually receded from the middle line of the body, while in the true pelvis near the outlet it rather exceeded this limit.

"4. Posteriorly and externally it was continuous with the pelvic wall.

"5. Inferiorly it was found on removing the whole pelvis that it had grown down under the pelvic arch; that it had incorporated in its substance practically all the upper part of the ischium, and of the pubis and the ilium near the acetabulum. It had grown out of the pelvis at the greater sacro-sciatic notch, and had so eaten through the bones just behind the acetabulum that the ilium here had become quite detached from the ischium and pubis.

"The lower part of the growth was more osseous than the upper, and contained many large spaces, some of them full of blood. It was very fragile and easily crumbled. There was no distinct demarcating line of tissue to circumscribe it, but it projected in an irregular manner into the tissues of the thigh in its upper part.

"One or two small glands were enlarged along the right Poupart's ligament. Some enlarged retroperitoneal glands were also found. The right ureter in its course to the bladder was stretched over the tumour.

"The spleen, kidneys, and other abdominal organs showed nothing of interest. The liver was large, pale, and fatty.

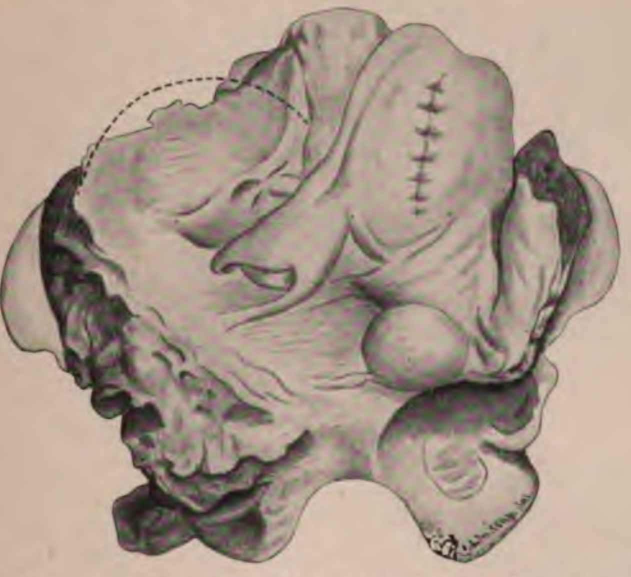


FIG. 42.—SARCOMATOUS ENCHONDROMA OF THE PELVIS. THE GROWTH LIES TO THE RIGHT, THE SUTURED UTERUS TO THE LEFT.

"The microscopic examination of the growth showed it to be composed almost entirely of large, rapidly-growing cartilage cells, with here and there small groups of cells suggestive of sarcomatous degeneration; there were also cysts at places. So it may have been an ordinary enchondroma with cystic changes, or with sarcomatous degeneration, or both."

It is impossible to decide when this tumour first began to grow. It may have been there before conception, and the sciatic pains would point to the nerve having been affected during the last two years. If it was there at the beginning of the pregnancy, it is quite certain that its rate of growth became very rapid during the gestation. The growth may have been simple to begin with, but there is no doubt of its malignant character finally, although it is difficult to demonstrate sarcomatous cells in it.

I regret that I had not operated a few days sooner, as there would have been a slight chance of saving the child's life, but we had no warning of its impending death. I do not know what caused its death.

CHAPTER XXIII

DELAY DUE TO FAULTS OF THE PASSENGER

Toughness of the Membranes—Large Size of the Fœtal Head—Hardness of the Head from Premature Ossification—Hydrocephalus—Malformations of the Fœtus—Spina-Bifida—Meningocele—Distention of the Body of the Fœtus—Distention of the Abdomen—Monsters—Shortness of the Umbilical Cord—Malposition of the Head—Malpresentations of the Head—Face and Brow Presentations—Cases—Malposition of the Arm in Head Presentations.

Toughness of the Membranes. — Under ordinary conditions the membranes rupture as soon as the os is fully dilated, but they are occasionally so tough that they withstand the pressure of the uterine contractions. It occasionally happens that the entire uterine contents are expelled *en masse*. As a rule, when this occurs, the labour is a precipitate, and not a prolonged, one. The cases I have seen of the latter have usually been premature ones, and the fœtus has generally been macerated.

Treatment.—Rupture the membranes by means of the finger-nail or a clean stylet. An ordinary hairpin is frequently employed for this, and, provided it is surgically clean, there are no objections to its use. By unskilled hands the scalp has been perforated in mistake for the membranes, so care must be exercised, especially in those cases in which there are no forewaters. A bowl should be used to catch the liquor amnii, as in that way the bed is kept dry and the patient more comfortable.

Large Size of the Fœtal Head.—If either of the parents has a large head, the fœtus may have the same. If the mother's pelvis is a very large one, no difficulty may arise; but if the pelvis is smallish, though not small enough to be called contracted, there may be great difficulty in delivering. The same difficulty may arise in cases of protracted gestation, as the child is then larger, and the head harder, than it would have been at the ordinary full time.

ordinary pelvis. The promontory is pushed slightly forwards. The brim is thus markedly contracted in the transverse, and slightly in the conjugate, diameter. At the outlet the tuber ischii are inverted and the pubic arch narrowed.

Diagnosis.—By external and internal measurements, the condition can be easily recognised.

Treatment.—The delivery of a live child through the natural passages is impossible, therefore Cæsarian section should be done.

Infantile Pelvis.—In these cases the pelvis is long in the conjugate, but narrowed transversely, and funnel-shaped in the cavity. The fœtal type has been maintained. The genital organs will be defective in development, so that pregnancy is not likely to occur.

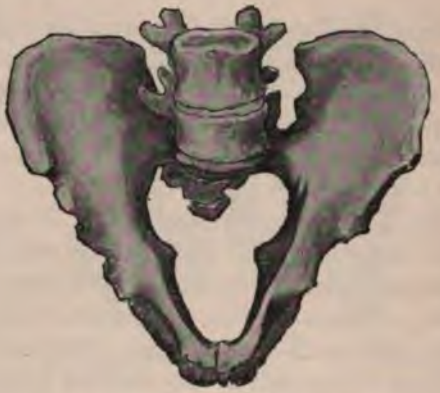


FIG. 39.—ROBERT'S PELVIS.

Funnel-shaped or Male Pelvis.—In this form the pelvis develops in the shape of a male pelvis. . It is deeper and somewhat narrowed transversely, especially at the outlet. The sacrum is longer and narrower than usual, and the promontory higher. The difference between the diagonal and true conjugate may be an inch, or even more.

Diagnosis.—This can only be made by careful internal measurements. The chief contraction will be found at the outlet in the transverse, and this diameter is exceedingly difficult to estimate.

Treatment.—The chief difficulty will be at the outlet. Forceps will generally overcome this, and if these fail and the child is alive, symphysiotomy can be done, or, in the last resort, craniotomy. In subsequent pregnancies induction of labour will be advisable.

OBLIQUE CONTRACTION.

Scoliotic Pelvis.—Lateral curvature of the spine will cause an oblique contraction of the pelvis by the greater part of the body-weight being thrown upon the side of the pelvis towards which the curvature lies. This side of the sacrum is driven upwards, and the pressure upwards through the acetabulum, when the patient stands, pushes that side of the pelvis inwards. The pubic symphysis is pushed towards the opposite side. The ischial tuberosity of the contracted side is everted. The oblique diameter, measured from the contracted side to the opposite sacro-iliac joint, is considerably shortened at the brim. The other oblique diameter is considerably larger.

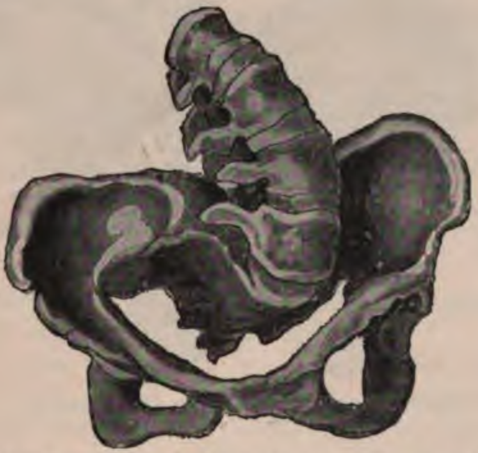


FIG. 40.—SCOLIO-RACHITIC PELVIS (FOTHERGILL).

As scoliosis is generally associated with rickets, there is likely to be more or less flattening of the pelvis as well, giving the **scolio-rachitic pelvis.**

Diagnosis.—Lateral curvature of the spine, especially in a rickety subject, will at once suggest the deformity, and an internal examination will confirm the diagnosis.

Treatment. — In slight cases there may be no difficulty in the delivery. In some cases forceps may succeed, but, if the deformity is at all marked, Cæsarian section should be done. Induction of labour may be done in some cases. Symphysiotomy is not applicable.

He made a second attempt on the following morning, and again failed. In the afternoon he sent her into hospital, with a note, saying that it was a case of hydrocephalus, with a head and foot presenting.

Condition on Admission.—The patient was in a very exhausted state, with a temperature of 100·2° F., and a pulse of 120. Palpation revealed that the uterus was firmly moulded round the child. There was no special thinning out of the lower uterine segment, so the retraction ring could not be felt. The uterus was quite hard, and there was no relaxation at intervals; it was in a condition of continuous tonic contraction. The round ligaments felt like small, rigid bars. The large head could easily be made out, and the bones be felt to crackle beneath the fingers. By the vagina a large, boggy mass was felt, extending into the pelvic cavity; behind it was a hand.

I perforated the head at once, and delivered by means of a cranioclast. The uterus would not retract, but lay in the abdomen like a collapsed football. Profuse bleeding came on. Immediately I cleared the placenta and membranes out of the uterus, and used bimanual compression to check the bleeding. The patient's abdomen was very flaccid, so that I could pass my hand behind the uterus, grasp it, and double it down. While doing this I was able to compress the aorta with the back of my wrist; for the time being this gave me complete control over the bleeding. An intra-uterine douche (120° F.) was given, and ended up with 30 grains to the pint of suprarenal gland. The uterus was still unretracted, so I plugged it firmly with seven long strips of iodoform gauze, and then firmly filled the vagina. The patient's pulse was now quite imperceptible at the wrist. Immediately after delivery an assistant had commenced giving her a saline infusion, and by the time I had finished she had received 4 pints under her breasts. She was also freely stimulated with ether and strychnine, and given ergot hypodermically.

By next day she had improved, but was still very weak. I left in the uterine plug for forty-eight hours. The uterus was then so firmly retracted round it that we had to chloroform the patient to remove it. There was no bleeding. The patient made a good recovery.

The condition of the uterus prior to delivery was an interesting one. It was as hard as it could be, with the round ligaments standing out like rods. It was in a condition of tonic contraction, and did not relax even when the patient was chloroformed. The wonder is that rupture had not occurred. I was quite sure it would not retract after delivery, so was prepared to deal promptly by plugging. In this way I was able to save the patient's life. A very few minutes' more delay would probably have been disastrous.

MALFORMATIONS OF THE FŒTUS.

Spina-bifida has been mentioned as occurring along with hydrocephalus. As a rule, the tumour is so soft that it will not obstruct delivery of the body, but, if it should, an opening should be made into it.

Meningocele.—We sometimes find a large meningocele connected with the back part of the head. I have seen a very large one in a case of hydrocephalus. If it causes any obstruction, perforation should be resorted to.

Distention of the Body of the Fœtus.—The chest of the child is occasionally distended by a hydrothorax. The head or the breech may be born easily enough, but the thorax sticks. A careful examination should be made, to determine what is causing the delay. As the child will be dead, there is no use in continuing excessive traction, but the chest should be opened at once with a perforator or a pair of scissors. The delivery will then be easy.

Distention of the Abdomen of the Fœtus.—This may arise from ascites, gas, a distended bladder, cystic disease of the kidneys, or tumour of the liver or other organ. When one meets with obstruction of the body a careful examination should be made under chloroform. By careful palpation, and, if necessary, passing the hand in cautiously, one can, as a rule, make out the condition. The child will be dead, so one need have no compunction in perforating the obstructing mass. A simple perforation is all that is usually necessary, but with a solid tumour it would be necessary to break up the mass.

Monsters.—Occasionally united fœtuses are born. Both children may be fully developed and united by a band at the sternum, as the famed Siamese twins and others were. In other cases there may be a parasitic attachment, as in the case of Laloo. There are many different forms of these monsters, and it is, therefore, difficult to make any suggestions as to how they should be delivered. Fortunately, nature seems able to overcome the difficulty in many cases. The method to be adopted would have to be decided according to the condition found, but one should do a destructive operation, rather than subject the mother to any risk from attempts to deliver the fœtus or fœtuses entire.

Shortness of the Umbilical Cord.—This may be actual, or acquired by the cord being wound several times round the neck or some other part of the fœtus. The cord is round the neck in a large proportion of cases, but, unless there are several coils, it is not, as a rule, sufficiently shortened to interfere with the descent of the child until the head is born. In some cases, however, it is so short that it will prove a serious cause of delay (see case, p. 458). It may only be a few inches long.

Dangers.—The cord may rupture, or the placenta may be prematurely separated. In the former condition the risk would be to the child, while in the latter there would also be some risk to the mother. It might cause inversion of the uterus, which would be exceedingly serious for the mother.

Diagnosis.—As a rule, acquired shortness of the cord can be easily diagnosed, as the cord will be found round the neck when the head is born. Actual shortness of the cord is much more difficult to determine. The descent of the child will be hindered, although the contractions may be strong. With each contraction a portion of the uterine wall will be dragged down.

Treatment.—When the cord is round the neck, if it is long enough, it should be drawn over the head, or slackened sufficiently to pass over the shoulders. If this cannot be done, the cord should be divided and delivery quickly effected, so as to get the end next the child tied, to check bleeding. With actual shortness of the cord one cannot reach it, so it will have to take its chances of tearing through or separating the placenta while the child is being delivered by forceps, or traction, if it is a breech presentation. Delivery should be done quickly in the interest of the child. If inversion occurs, it must be reduced at once.

Malposition of the Head.—When the head presents in either of the *occipito-posterior positions*, the labour is generally prolonged. As I have already stated, these cases are often delayed in the first stage of labour, especially if there is not a good bag of forewaters, but it is during the second stage that delay most frequently occurs.

If the head becomes well flexed the occiput will come down on the pelvic floor first, and follow the usual rule—*i.e.*, it will pass forwards under the pubic arch. It thus has to pass through three-eighths of a circle, and will occupy a much longer time than if it had been to the front to begin with. This is what is called long rotation. When this occurs the labour will usually finish by natural efforts, unless uterine inertia has come on.

In a good many cases, however, the sinciput passes forwards by a short rotation, and the occiput backwards, into the hollow of the sacrum. This gives a persistent occipito-posterior case. In these cases flexion has not occurred, and the fore part of the head first reaches the pelvic floor, and necessarily passes forwards. This malrotation is apt to occur with small heads, as they can pass through the brim without flexion.

If the contractions are still strong, the child may be born by natural efforts, but, as the forehead of the child does not fit under the pubic arch nearly so well as the back of the head, a much greater strain will be thrown on the perineum. As the contractions of the uterus drive the child downwards, the resistance of the perineum sends the head forwards, and causes it to flex as it passes out. The mechanism thus differs from that of the occiput anteriorly, in flexion occurring instead of extension. The perineum is very apt to be torn.

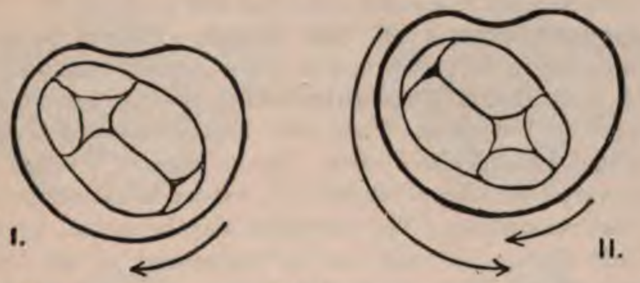


FIG. 43.—DIAGRAM TO SHOW THE DIFFERENCE BETWEEN OCCIPITO-ANTERIOR AND OCCIPITO-POSTERIOR POSITIONS AS REGARDS INTERNAL ROTATION.

I., Occipito-anterior, occiput rotates to the front through one-eighth circle; II., occipito-posterior, occiput rotates to the front through three-eighths circle, or else forehead rotates to the front through one-eighth circle (Fothergill).

Treatment of Occipito-Posterior Cases.—If the head is well flexed, the case can be left to nature for a reasonable length of time, but, if inertia begins, forceps should be applied. If the occiput has not rotated, this may be done manually. It is quite easy to pass the hand in and rotate the occiput forwards, but this is of no use unless the body is rotated at the same time. This can be done by the external hand, or, if the head is not fixed in the brim, by passing the internal hand in and bringing the anterior shoulder forwards. The forceps can then be applied and delivery effected. If the forceps are applied before the occiput has rotated, rotation will occur during delivery. When it occurs, the blades should be taken off, and reapplied to the sides of the head in the cavity. When the occiput lies in the hollow of the sacrum, it must be delivered posteriorly. Great care must be taken of the perineum, or it will be torn.

The ordinary double-curved instruments grasp the head rather too far forwards, and therefore do not promote flexion. They thus, to a certain extent, encourage malrotation. Milne-Murray has devised a straighter instrument than his ordinary one, which is an improvement, but the ordinary instrument does so well that one hardly feels disposed to cumber one's bag with a second set.

Malpresentations of the Head.—Parietal presentations occur, especially in flat pelves, and have been already dealt with (p. 244).

Face and Brow Presentations.—Face presentations occur about once in 200 cases. They may be conveniently divided into *primary* and *secondary* face cases. In the primary the face presents from the very beginning of labour—*i.e.*, extension has occurred before labour has commenced. The extension may be caused by anything which will elevate the chin, as an enlargement of the thyroid or thymus glands, an enlargement of the chest, or the arms folded under the chin, or it may be caused by a spastic contraction of the muscles of the back of the neck, which will necessarily elevate the chin. In the secondary, the extension is caused by the occiput being arrested in its downward descent at the beginning of labour. A dolichocephalic head will predispose to this, but the most frequent cause is obliquity of the uterus; the occiput gets pushed against the side of the brim and is arrested there, and, as the front part of the head is free to enter the brim, it does so, and a face presentation results. A flat pelvis also predisposes to this presentation. As we have already seen, a certain amount of extension occurs as the head enters the brim in a flat pelvis, and a little increase of this may very easily bring the face down. With a dead child the face not infrequently presents.

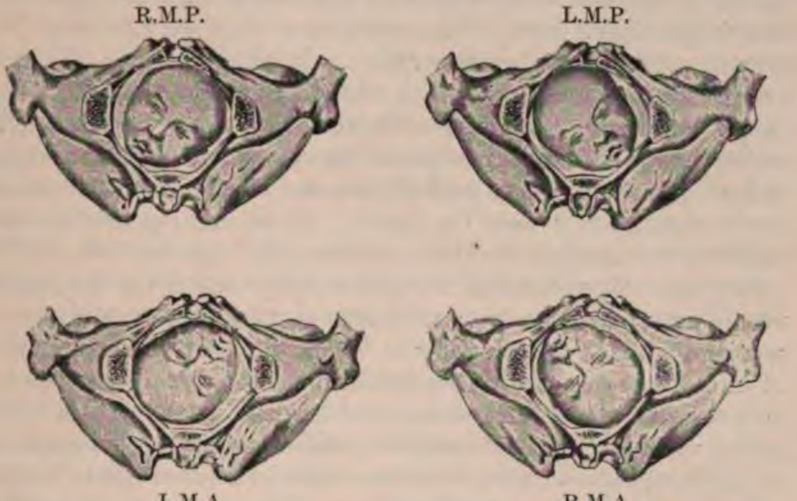
The positions are four in number, as in vertex presentation. The chin or mentum is the leading part or denominator. The best way to consider the presentations in the four positions is to look upon them as having been converted from ordinary vertex presentations, thus:

1. L.O.A. gives R.M.P., Right mento-posterior (1st in frequency).
2. R.O.A. ,, L.M.P., Left ,, ,, (3rd ,, ,,).
3. R.O.P. ,, L.M.A., Left mento-anterior (2nd ,, ,,).
4. L.O.P. ,, R.M.A., Right ,, ,, (4th ,, ,,).

As the L.O.A. position is by far the commonest in vertex presentations, the R.M.P. position is the most frequent in face presentations.

As the head comes through the pelvis, the movements of the face are the same as of the occiput in vertex presentations, except that the first and third movements are reversed. Thus, with the face presenting, the first movement is extension instead of flexion, and thirdly, flexion instead of extension as the head is born. The rotation movements are the same as in vertex cases—*i.e.*, in internal rotation the leading part passes forwards, and in external the leading shoulder does the same.

As the vast majority of face cases begin with the chin posterior, the internal rotation is exactly the same as with occipito-posterior cases—viz., either a long rotation of the chin through three-eighths of a circle when there is full extension, or a short rotation of the forehead forward through one-eighth of a circle, and of the chin into the hollow of the sacrum, when extension is only partial. In the latter cases the forehead strikes the pelvis floor first, and is thrown forwards.


R.M.P. L.M.P.

L.M.A. R.M.A.

FIG. 44.—FOUR POSITIONS IN FACE PRESENTATIONS FROM BELOW (CROOM).

The labour is usually delayed. As already stated, the first stage will be prolonged, because the face is not a good dilator, and does not allow of the formation of a good dilating bag of forewaters, and the membranes are also liable to rupture early. In the second stage there will be delay, because the diameters of the head do not fit the pelvis so well as when the occiput is leading. As the majority of the cases are mento-posterior to begin with, if long rotation occurs there will be considerable delay, but the labour may be finished by natural efforts. On the other hand, if the chin passes into the hollow of the sacrum, the face will become impacted, and delivery by natural efforts will hardly be possible, unless the child is very small or macerated. The neck of the child is so short that the retracted head and chest must pass the brim together, and there will not be room with an ordinary-sized child.

Diagnosis.—The condition may be recognised by abdominal palpation, but the diagnosis is usually made by vaginal examination. In the early stages, the membranes will protrude in a sausage shape and the presenting part be high up, so that there may be some difficulty in making out the presentation. It will feel softer and more irregular than the vertex. When the orbital ridges, eyes, nose, and mouth, can be felt, it is easy of recognition. After the membranes are ruptured, the finger can be passed into the mouth, and the presence of hard gums and tongue and the absence of meconium will enable you to distinguish it from the breech. Avoid injuring the eyes, and make out the direction the chin is pointing in.

Prognosis.—If the case is recognised early, and if the membranes remain intact until the os is fully dilated, the risk to the mother, if prompt treatment is then adopted, should not be much greater than in an ordinary case of artificial delivery, but the risk to the child will be greater than with an ordinary vertex case. If the case is left to nature, the risk to the mother will be greater, and to the child markedly so. If the pelvis is contracted, there will be an added risk to both.

Treatment.—Preserve the membranes intact as long as possible. If the position is mento-anterior, the case may be left to nature, provided the contractions are strong and the head is not very large. If inertia uteri comes on, or no advance is being made after a reasonable time, forceps should be applied. In primary mento-posterior cases, version should be done as soon as the os is fully dilated. In secondary mento-posterior cases, an attempt should be made to bring the occiput down, so as to convert it into an ordinary vertex presentation. The best way to do this is to pass the hand in, grasp the occiput, pull it down, and push the forehead up, so as to cause flexion. This can be quite easily accomplished at the time of rupturing the membranes, or shortly afterwards, before the uterus is firmly retracted round the child. In primary cases, as a rule, it cannot be done, as the tumour, or whatever has thrown the chin up, will prevent flexion. When the head is flexed the case may be left to nature, but I prefer to deliver at once with forceps. Schatz's method of converting a face into a vertex presentation looks well on paper, but is not very practicable, for the simple reason that, in the majority of cases, the chin, and therefore the chest, lie to the back, and it is impossible to put pressure upon the chest in the right direction. If you fail to get the occiput down, version should be done at once.

If labour has gone on for a considerable time and the face is jammed into the pelvis, version or rectification is out of the question. If version is attempted after the uterus has become retracted round the child, rupture will be almost sure to happen, as in Case III. Extension and rotation should be assisted by bringing the chin down and pressing it forwards with the fingers. If nature fails to deliver, forceps must be applied. If the chin is lying in the hollow of the sacrum, forceps may be tried if the child is still alive, and if the head is not very large, but the chances are that delivery will not be possible. If the child is dead, or if you fail with forceps, craniotomy should be done at once. The perineum is very ready to tear badly during delivery, either by nature or forceps.

Head Moulding.—When born, the head will be considerably moulded. The eyelids, cheeks, nose, and lips will be much swollen and congested, from the formation of the caput succedaneum. There will probably be effusions of blood into the conjunctivæ. The head will be flattened from above downwards, and the frontal and occipital bones will be bulged. The occipito-frontal diameter of the head will be considerably lengthened. The elongated occipital portion of the head will give a dolichocephalic appearance to the head. This is usually given as a cause of face presentations, but in the majority of cases it is an effect, and not a cause. The swelling of the lips will probably prevent the child from sucking for a day or two, but the moulding and swelling pass off very quickly. It is well to warn the friends that the face will be disfigured, or they may blame you for having caused this. The mother should not be allowed to see the child immediately, as its appearance may cause her considerable shock.

Brow Presentation.—This may be looked upon as an arrested face presentation. A certain amount of extension has occurred, but not sufficient to bring the chin down. If extension goes on, the case will either end as a face one, persist as a brow, or, if flexion occurs, may be converted into an ordinary vertex case.

Brow cases are much rarer than face ones, and are caused by the same conditions acting in a minor degree.

Diagnosis.—The anterior fontanelle is very easily felt, and the face can be reached, but the posterior fontanelle cannot be touched.

Prognosis.—If the case is left to nature the risk to mother and child will be greater than in face cases. If the condition is recognised early, and properly treated, the risk to the mother should not be great, but the child will have to run the risk of artificial delivery.

Treatment.—If the case is seen early, the head should be flexed, and, if this cannot be accomplished, version should be done. If it is too late for version, the chin should be brought down, so as to convert it into a face case. If this cannot be done, forceps should be tried, and, if they fail, craniotomy must be resorted to.

In one case I delivered with forceps the brow did not rotate forwards, but came out in the transverse diameter. The pelvis was, fortunately, a very roomy one. The child was alive.

Cases of Face Presentations.—CASE I.—A multipara with a somewhat pendulous abdomen was found, when first seen, to have the os fully dilated and the membranes intact. The face presented R.M.P., and was not engaged in the brim. From her account the face had presented at her previous labour, and version had been done, but the child was lost. I at once ruptured the membranes, grasped the occiput, flexed the head without any difficulty, and applied forceps. Delivery of a large live child was easily effected.

CASE II.—A multipara with a fairly large pelvis had been in labour a considerable time. The membranes were ruptured, but the uterus was not moulded round the child. The face presented, but was not jammed into the pelvis. The patient was put deeply under chloroform, and I turned cautiously. When the body was born the arms passed up by the side of the head. One was easily relieved, but the other had passed behind the head. As I was afraid of losing the child, I decided to break the humerus, as the quickest way of getting the arm freed. I did so, and delivered the child alive. The arm was bandaged to the body for a few days and then put in splints, and it soon united.

CASE III.—The patient, a multipara, was brought to hospital from some distance in the country. She died a few minutes after admission.

Her former labours had been normal. The face presentation (mento-posterior) had been recognised early in labour. The child was large, and the face failed to enter the brim. Various forms of forceps, axis-traction, and others had been tried, but all had failed. A furrow was noticed to have formed somewhat obliquely across the abdomen below the umbilicus, but the terrible significance of this had not been recognised. An attempt was now made to do version, and as the hand passed into the uterus the patient suddenly collapsed. The hand was withdrawn, and the patient was brought in an ambulance some nine miles. As already stated, she died a few minutes after admission, before anything could be done.

Bandl's ring was very apparent, running obliquely across the abdomen just below the umbilicus. The uterus was evidently ruptured. We were fortunately allowed to remove the uterus. When it was hardened and opened we found the rupture just below Bandl's ring. It was the exact shape of the back of a closed hand. The peritoneal layer was intact. There was a large extravasation of blood under the loose peritoneum of the lower uterine segment (see Fig. 21, p. 188).

In this case the occiput ought to have been brought down early, or, failing that, version done before retraction set in. The mother's life would have been saved and probably the child's also. To attempt version after failure with forceps, especially when Bandl's ring was apparent, was almost absolutely sure to cause rupture. Craniotomy should, of course, have been resorted to.

Malposition of the Arm in Head Presentations.—The hand or whole arm occasionally presents with the head. It may be by the side or back of the head. When it is by the side of the head it may not seriously interfere with labour, but when it is behind the head, with the forearm across the back of the neck, the condition is a very difficult one to deal with.

Treatment.—When the condition is diagnosed early, the arm should be replaced by sweeping it to the front of the child's body. In the posterior position this may be difficult to accomplish, but the arm should be straightened at the elbow, and the forearm brought up by the side of the head, and carried forwards over the face. If this cannot be done, delivery should be effected by version. If the head and hand are in the pelvis, replacement may be impossible. Delivery should then be effected by forceps.

CHAPTER XXIV

DELAY IN THE THIRD STAGE OF LABOUR

Faults in the Powers—Faults in the Passages—Faults in the Passenger—Adherent Placenta—Succenturiate Placenta—Adherent Membranes—Treatment of Delayed Third Stage—Treatment of Hourglass Contraction of the Uterus—Treatment of Adherent Placenta—Treatment of Adherent Membranes.

DELAY in the third stage of labour is usually dealt with under the heading of *Retained Placenta*. As in the other stages, this may arise from faults on the part of the powers, passages, or passenger.

Faults in the Powers.—*Uterine inertia* may arise in the third stage from exhaustion of the uterine muscle, through prolongation of the first or of the second stage. In constitutionally weak patients it may continue throughout the third stage, after having been present during the other stages. It may also arise after rapid emptying of the uterus artificially, when in a state of inaction. After the child is born there is usually a short period of rest, until the uterine muscle regains tone, and then contractions begin, and retraction gradually increases, until the placenta is separated and expelled into the vagina. The placenta may be retained in the vagina if the secondary powers are at fault.

Faults on the Part of the Passages.—In a contracted pelvis, or in a case with a tumour in the lower part of the uterine wall, the placenta may be retained after separation by the promontory or tumour partially obstructing the passage, but a more serious fault is *hourglass contraction* of the uterus. In this condition the uterus is constricted about its middle, and the placenta is entirely or partially retained in the portion of the uterine cavity above the constriction. The contraction is really at Bandl's ring, and not at the internal os. The lower uterine segment and cervix remain relaxed. In nearly every case the condition is caused by the administration of ergot. It used to be not an uncommon occurrence among the Glasgow Maternity outdoor patients when ergot was given as a routine before the expulsion of the placenta, but of late years, since the administration of ergot has been stopped (except after the third stage is over), no cases have occurred. Occasionally the cervix and lower uterine segment may contract and cause retention of the placenta, but this is rare. It does, however, occur in cases where the placenta is retained by adhesions for a considerable time, and may form a very serious barrier to the subsequent removal of the placenta.

Faults on the Part of the Passenger—Adherent Placenta.—This condition is due to disease of the placenta or of the decidua, which prevents separation taking place through the usual layer. The placenta is much more fibrous and tough than usual. The firmness and extent of the adhesions vary. Thus it may be total, but slight, and neither separation nor bleeding may occur from uterine efforts. It can easily be completely separated manually. Total firm adhesions will prevent bleeding, but manual separation will be very difficult. It cannot be peeled off, but will have to be removed bit by bit, and portions may easily be left behind, and the uterine wall may be injured. In partial adhesions, if the upper part of the placenta only is adherent, the lower part will separate and bleeding occur, as retraction of the lower part of the uterus is hampered. If the lower part is adherent, and the upper part separates, bleeding will not occur, as the upper part of the uterus will retract.

Succenturiate Placenta.—In this condition there are one or more small lobules of placenta in the chorion, quite separate from the main mass. They may very easily be left behind, as the chorion is very apt to tear away, and the amnion to strip off them. Unless a careful examination of the chorion is made, you may miss the condition at the time of delivery, and only discover it afterwards on the expulsion of the mass, or by secondary post-partum hæmorrhage occurring. Fortunately the condition is rare.

Adherent Membranes.—The chorion may be partially or entirely adherent when the placenta is in the same condition, but this may occur without adhesion of the placenta. Retention of a portion of membranes is very often the result of improper conducting of the third stage of labour. As a rule, both amnion and chorion are retained, entirely or in part, but occasionally the amnion comes away completely, and you may be easily misled by this, if you do not examine the sac carefully to see if both layers are present.

The following cases illustrate this :

CASE I.—I was called to a primipara, who was miscarrying at the sixth month. A bag of membranes was protruding at the vulva. I ruptured this, and the fœtus was expelled in a few minutes. The placenta came away in ten or twelve minutes, with, apparently, a complete sac. As I had ruptured the sac, I did not examine the membranes particularly. I took it for granted that both layers were present. There was no hæmorrhage then or subsequently, but three days later the entire chorion was expelled. There were no bad effects, but there might have been. The entire chorion had been adherent, and the amnion had protruded through the lower part. That was what I had ruptured. The placenta had separated at its edges from the chorion, and had come away with the amnion complete. This case shows that one cannot be too careful in examining every case, to see if both membranes are complete. Nothing should be taken for granted.

Case II.—This patient suffered from severe unavoidable hæmorrhage. When she was delivered she was in a very critical condition, and no special attention was paid to the placenta and membranes, which seemed to be complete. Some days later the lochia became very profuse and foul, and when I examined the uterus, I found, and removed, an extremely stinking chorion. From the size of the mass removed the whole of the chorion must have been retained. I douched the uterus out thoroughly, and swabbed the interior with iodine—equal parts of the liniment and the tincture. The patient made a satisfactory recovery.

Case III.—A primipara was delivered naturally after an easy and short labour, and the placenta came away with a complete bag of membranes, but on examining it carefully I found that the chorion was wanting. I at once explored the uterus and peeled the complete chorion off. The patient made a normal recovery.

If I had trusted to a mere cursory glance at the placenta in this case, I might easily have missed noticing that the chorion was not there, as there was nothing in the delivery to indicate its retention.

Treatment of Delayed Third Stage.—When there is uterine inertia, the uterus should be actively massaged, to stimulate contractions. Ergot should not be given, as it may cause hourglass contraction of the uterus. If there should be much hæmorrhage, the uterus should be very firmly compressed, and pressure applied downwards and backwards to separate and expel the placenta, and as soon as it is away a hot douche should be given and a hypodermic of ergotin. Massaging of the uterus should be kept up until firm retraction has occurred. If firm compression of the uterus fails to expel the placenta and stop the bleeding, the aseptic hand should be introduced and the placenta removed. The uterus can then be firmly kneaded on the hand in its cavity, or in the posterior fornix behind the cervix. In this way very effectual pressure can be applied to the uterus, and this will cause it to contract and stop the bleeding.

In many cases of retention of the placenta it is really lying in the vagina, and it can then be expelled by pressure upon the uterus, or it may be withdrawn by traction on the cord. With a contracted pelvis, or a tumour in the lower uterine segment, pressure from above will usually suffice.

Treatment of Hourglass Contraction of the Uterus.—Put the patient under chloroform, and pass the aseptic hand into the uterus in a cone-shape, and dilate the constriction. If the placenta is not separated, peel it off, and remove it at once ; then give an intra-uterine douche.

Treatment of Adherent Placenta.—The aseptic hand must be passed into the uterus, and the placenta peeled off by inserting the edge of the hand between it and the uterine wall. Always separate it completely before attempting to remove it, as you might invert the uterus if you dragged on the placenta before the upper part of it was separated. When it is very firmly adherent you may have to remove it in bits. Small portions are then liable to be left behind, and the uterine wall may be injured. Give an intra-uterine douche as soon as the placenta and membranes are cleared out.

In every case where the placenta is not complete, or a lobule of a succenturiate placenta has been left behind, you must explore the uterus at once and remove the adherent portion.

Treatment of Adherent Membranes.—In every case where you are quite sure a portion of the membranes has been retained, you should explore the uterus at once and clear it out. A small piece of membrane may not cause any mischief, but you cannot trust to this. With proper aseptic precautions there is no risk in exploring the uterus. In all cases where the hand has been introduced an intra-uterine douche should be given. It is advisable to give the patient an anæsthetic when the hand has to be passed into the uterus. The operation can be done quite well without it, but causes considerable pain.

CHAPTER XXV

PRÆTERNATURAL LABOURS

Causes of Irregular Presentations—Pelvic Presentations—Positions—Mechanism—Causes of Delay in Breech Cases—Upward Displacement of the Arms—Impaction of the After-coming Head.

IRREGULAR PRESENTATIONS.

IN these labours some other part of the child than the head presents. The presentation may be pelvic or transverse.

Causes of Irregular Presentations.—Broadly speaking, the fœtus may be said to accommodate itself to the shape of the uterus, more especially during the later months of pregnancy. The long axis of the uterus will come to be occupied by the long axis of the fœtus; therefore, in the vast majority of labours at full time, either the head or the breech of the fœtus presents. The cause of the preponderance of head presentations is said to be gravity, as the head is much the heavier portion of the fœtus, but the shape of the uterus must also be taken into account. The flexed back and breech of the fœtus naturally fit the fundus much better than the head. By reflex movements, the fœtus probably moves itself into the position which will cause least pressure upon it. Until well on in pregnancy the fœtus is relatively small, compared to the cavity of the uterus, and it may occupy any position and change this position frequently, but, as it nears full time, it takes up the position which it will be found to occupy when labour commences. This accounts for the frequency of irregular presentations in premature labours. The tonicity of the fœtus helps to keep it in its final position, but if it be dead and macerated this no longer holds good, hence the frequency of irregular presentations with dead fœtuses. Anything which will interfere with the normal shape of the uterus, such as tumours or congenital malformations, or with the shape of the fœtus, as hydrocephalus, malformations, and monsters, will disturb the balance, and tend to irregular presentations. Overdistention of the uterus from hydramnios also tends to this, as it allows greater freedom of movement to the fœtus, so that at full time it is in much the same position as a sixth or seventh month fœtus under ordinary conditions. In multiple pregnancies, irregular presentations are common from the same cause.

Pelvic Presentations.—These occur in about 3 per cent. of all labours. They are divided into three varieties—viz., breech, foot, and knee, according to whether the buttocks, foot, or knee enters the brim first. The attitude of the fœtus *in utero* is the same as when the head presents—viz., one of flexion. The thighs should be flexed upon the abdomen and the legs upon the thighs. As a rule, the feet are well up, but, if they happen to be low down, one or both may be felt at the brim. In some cases the legs are not flexed, but extended, and the feet then lie well up on the chest. In this condition impaction is liable to occur, as we shall see later. If the fœtal attitude of flexion becomes undone, the knee presents. This is the rarest of the three varieties.

Causes.—Anything which interferes with the normal shape of the uterus or fœtus tends to cause pelvic presentations—*e.g.*, excessive liquor amnii, multiple pregnancies, tumours of the uterus or fœtus, contracted pelvis, obliquity of the uterus, placenta prævia. Monsters, dead or premature children, and those suffering from hydrocephalus, frequently present in this way.

Diagnosis.—By abdominal palpation the rounded head can be made out at the fundus. The fœtal heart will be heard loudest above the umbilicus. The membranes, if unruptured, will protrude in a sausage-shape. They are likely to rupture early, because the breech does not effectually dam back the liquor amnii. The presenting part will be much softer than the head, not so rounded, and no sutures or fontanelles will be felt. The sacrum, coccyx, and ischial tuberosities can be recognised. When the membranes are ruptured the anus and genital organs can be felt. The anus can be told from the mouth by the fact that there are neither hard gums nor tongue inside of it. The anus has actually been mistaken for the undilated os, and the perineum of the child torn by attempts to dilate it. The examining finger will be stained with meconium. The crest of the ilium can often be reached, and the finger passed into the fold of the groin. This may be mistaken for the axilla, but in the latter you should be able to feel the ribs. When the foot presents it can be distinguished from the hand in that it is placed at right angles to the limb, the heel is prominent, the toes are about equal length, and the big-toe cannot be separated at right angles from the others or bent over the sole, as the thumb can. The knee may be distinguished from the elbow by being broader and not so pointed. It will be somewhat depressed in the centre with a prominence at each side, while the elbow will be prominent at the centre and depressed at each side. If you have any difficulty in deciding the matter, pass your hand along the limb until you reach either the foot or hand.

Prognosis.—The mother does not run any greater risk than in an ordinary head-first labour, but the child does. About 20 per cent. of the children are lost. The danger to the child arises from early rupture of the membranes, and delay in the delivery of the after-coming head, allowing of pressure upon the placenta and cord. The child may also make efforts to breathe while the head is in the vagina, and become suffocated from drawing mucus, etc., into its air-passages. It may also be injured, and even killed, during artificial delivery. The legs, arms, or clavicles may be broken or dislocated, and, what is of more consequence, the neck dislocated and the spinal cord torn. In contracted pelves the skull may be fractured, or a blood-vessel burst in the brain. I have seen a skiagram, taken from a child a month old, which showed fractures of both femora and one arm, which had evidently occurred in delivering the child by the breech.

Positions.—There are four positions as in ordinary vertex cases. The sacrum is usually taken as the denominator, but unfortunately it is not the part which leads, neither does it follow the rule of internal rotation—viz., to pass forwards under the pubic arch. It is the front hip of the child which leads and rotates forward. I shall adopt Berry Hart's nomenclature, and divide the positions into dorso-anterior and dorso-posterior, and each of these into right and left coxa-cotyloid. Right and left, anterior and posterior, all refer to the mother.

1. Dorso-anterior, Right coxa-cotyloid = L.S.A.
2. ,, ,, Left ,, ,, = R.S.A.
3. Dorso-posterior, Right ,, ,, = R.S.P.
4. ,, ,, Left ,, ,, = L.S.P.

In the dorso-anterior the back of the child lies anteriorly, and in the first the child's left hip will be to the front and right side of the pelvis, R.C.C. In the second the child's right hip will be to the front and left side of the pelvis, L.C.C. In the dorso-posterior the back of the child lies towards the back of the pelvis, but either the right or left hip will be to the front. In the third the right hip will be to the front and right of the pelvis, R.C.C., and in the fourth the left hip will be to the front and left of the pelvis, L.C.C.

The first is by far the most frequent, and the third the next in frequency, as in vertex cases.

Mechanism.—If the fœtus is small the breech may be driven straight down, but, as a rule, the anterior hip passes down in advance. The first movement is one of descent, with the anterior hip in advance. The bisiliac diameter passes down in one or other oblique diameter. In the first and third it is the in left oblique, and in the second and fourth in the right. When the leading or anterior hip reaches the floor of the pelvis, it follows the rule for internal rotation, and passes forwards under the pubic arch, and the posterior one is forced over the perineum by a movement which is practically extension. The legs and body are then expelled. The arms should be folded across the chest. The anterior shoulder passes forwards under the pubic arch, and the posterior sweeps over the perineum. The after-coming head enters the pelvis with its long diameter, the occipito-frontal, in the transverse, and as it comes down, the occiput rotates forwards under the pubic arch, the forehead passing into the hollow of the sacrum. This causes an external rotation of the body. The nape of the neck is fixed under the pubic

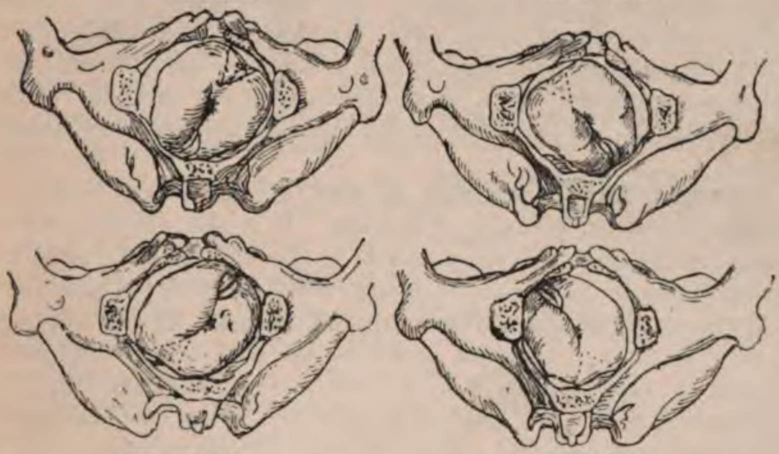


FIG. 45.—FOUR POSITIONS IN BREECH PRESENTATION: FROM BELOW.

arch, the chin, face, and forehead sweep over the perineum by a movement of flexion, and the birth is finished. In a few rare cases the chin, instead of the occiput, passes forwards under the pubic arch. The chin, face, and forehead may then be expelled by flexion, or the occiput and vertex sweep over the perineum and the head be born by a movement of extreme extension, the face of the child looking directly into the vagina as the birth is completed.

The caput succedaneum will be over the leading hip and genital organs. The scrotum of a male may be very much swollen, and quite black from effused blood.

Causes of Delay in Breech Cases.—The first stage is apt to be prolonged by the membranes rupturing early. In the second stage we get delay from *impaction*. The breech comes down into the pelvis, and is jammed there. This may happen with a large child, when the soft parts are rigid, when a tumour obstructs, when the pelvis is contracted, but a very common cause is extension of the legs, so that the feet lie well up on the chest and are caught by Bandl's ring.

Upward Displacement of the Arms.—This is apt to happen if traction is made on the legs. It is also apt to occur in contracted pelves. The elbows hitch on the brim, and the arms are thrown up by the side of the head and effectually block the passage.

Impaction of the After-coming Head.—This is very apt to occur in contracted pelves, also when the head is large, and when traction is made on the legs, without at the same time applying suprapubic pressure. If traction is made on the legs, the head tends to become extended, and a long diameter is thus substituted for a short one, so the head is apt to be arrested.

Treatment.—Keep the membranes intact as long as possible. Leave the delivery to nature until the breech is born, and the body expelled, as far as the umbilicus, then draw down a loop of the cord and feel if it is pulsating. If the cord is quite pulseless and flaccid, the child is dead, and there is no need for hurry ; if it is pulsating quite freely, there is no immediate danger to the child ; but if pulsation is very quick and feeble, delivery must be effected quickly, if the child is to be saved. In any case, when the child is alive delivery must not be prolonged many minutes, as the risk is considerable from pressure upon the placenta or cord, or from the child attempting to breathe, and thus suffocating itself by drawing mucus into the air-passages. The child's body should be wrapped in a warm towel to prevent it from getting chilled. When the body is being expelled, suprapubic pressure should be kept up to keep the head flexed and prevent the arms passing up by its side. If the arms are not quickly expelled, they must be brought down. Seize the child's legs and swing the body as far out of the way as possible with one hand, so as to allow the fingers of the other hand to be passed along the front of the chest until the nearest arm is reached. The fingers should be passed into the bend of the elbow, and the forearm and hand swept down over the front of the child. Relieve the more accessible arm first, and then the other can usually be easily reached. You will probably have to change hands to relieve the second arm. The head may be expelled by nature, but, as a rule, assistance will be required. The best method is by suprapubic pressure, which can be combined with traction on the body. With the patient on her back, get an assistant to press firmly on the uterus downwards and backwards through the abdominal wall. This may be sufficient to expel the head, but, if not, traction can be combined with it. Place the body of the child on your left arm, and pass the fingers of the left hand along the vagina into the mouth of the child, or on each side of its nose. The right hand should either grasp over the shoulders, or its fingers should be passed into the vagina against the occiput. The body of the child should then be swung as far forwards as possible towards the mother's abdomen, and the head flexed and levered out when the face lies in the hollow of the sacrum. If the face has rotated forwards, the body of the child should be swung back towards the mother's back, and the face be brought out first by flexion. Care must be taken not to draw the head out too quickly, as the perineum may be badly torn. Suprapubic pressure is by far the best method, and should always be practised along with traction, if not sufficient alone. It is following nature's method of expulsion, and tends to increase flexion, while traction from below tends to cause extension, of the head.

In applying traction to the body of the child, care must be taken not to injure the neck, and if the fingers are hooked into the mouth, not to tear the cheek or break the jaw. If there is any delay, the child will be born asphyxiated, so, in every case, preparations for reviving it should be made beforehand.

Treatment of Delayed Cases.—When the membranes rupture early there will be delay in the *first stage*, and, as the liquor amnii will be completely drained away, the pressure upon the child may soon begin to tell. The best method of hastening dilatation is by means of Champetier de Ribes' bag. It will prevent the escape of any liquor amnii which is still in the uterus, and thus help to prevent injurious pressure upon the child. Manual dilatation under chloroform may be necessary.

Second Stage.—Impaction of the breech may be caused by the large size of the child, rigidity of the soft parts, contracted pelvis, tumours, or extension of the legs, so that the feet lie well up on the chest. The usual explanation of the cause of impaction when the legs are extended is that the pelvis is flexed upon the trunk at the lumbar articulations, and the trunk, pelvis, and legs of the fœtus form a wedge which cannot pass through the maternal pelvis. I do not agree with this. The pelvis of the child is jammed into the mother's pelvis, and is not flexed in the way described. In these cases the liquor amnii will be drained away early, and moulding of the uterus round the child will be evident. Bandl's ring begins to form, and as the feet lie above it they are caught by it, and the child is hitched by its feet. With each contraction of the uterus Bandl's ring contracts, and the child is held fast, instead of being forced down.

The following case illustrates this. The patient was thirty-nine years of age, 11-para. Her former labours had been easy, except the last one, three years ago, when I had delivered her, with forceps, of a very large child. The membranes ruptured in the morning, but contractions did not come on until 2 p.m. By 9 p.m. the breech had descended into the cavity. The pains were very strong, but no further advance was made during the next hour, so the nurse, whose case it was, sent for me. I found the uterus was moulded round the body. The breech was in the cavity, dorso-anterior R.C.C. The contractions were exceedingly strong, but no advance was being made.

The patient was put very deeply under chloroform, as I wished to find out the cause of delay before delivering. On carefully passing my hand in, I found, as I expected, the legs extended. The retraction ring was very distinct, forming a ledge round the interior, and the feet were both hitched above it. The cause of the arrest was perfectly plain, as no descent could take place so long as the feet remained above the ring. The uterus was so closely moulded round the body of the child that I had some difficulty in unhitching the feet and drawing one of the legs down. The body was easily delivered, but, in spite of firm suprapubic pressure, one of the arms passed up. The elbow, I suspect, was caught by the ring. When it was freed, delivery of the after-coming head was easily accomplished. The child, a large male, was alive. The mother made a good recovery.

The impacted breech may be delivered by forceps, but the instruments are prone to slip. If possible, a foot should be brought down, and then there will be no further difficulty. This can easily be done when the legs are flexed, but when they are extended the greatest care must be taken, and the patient should be deeply under chloroform, as the lower uterine segment might very easily be ruptured. If a foot cannot be brought down, traction should be made on the groin by hooking the fingers through, passing an aseptic fillet, or using a blunt hook. There is great risk of fracturing the femur, especially when the blunt hook is used. In some cases the breech cannot be got through until it has been broken up. The cephalotribe should be used to deliver with, and the after-coming head should be perforated, before an attempt is made to drag it through.

Upward Displacement of the Arms.—This can be prevented, in many cases, by keeping up suprapubic pressure during the descent of the body. The method of dealing with the arms has already been described. If an arm happens to be displaced behind the head, and the forearm cannot be swept forwards, and over the face, it may be necessary to break the humerus. This accident, or separation of the epiphysis and diaphysis, or fracture of the clavicle, may happen in any case. The arm may be paralyzed from injury to the brachial plexus.

Impaction of the After-coming Head.—This may be due to disproportion between the size of the passage and the head, from a large head or a small pelvis, but is most frequently caused by extension of the head by traction from below, without suprapubic pressure. Suprapubic pressure, combined with traction from below, as already described, will often suffice. Forceps may be used, and they act well. The body of the child should be thrown well forward on to the mother's abdomen when the chin is behind. The blades are applied to the sides of the head on the front of the child's body, so that the chin lies between the shanks. Traction will then rapidly deliver the head. In breech cases it is well to have your forceps ready, so that in case of need no time may be lost in applying them.

If an after-coming head is too large to pass, or the pelvis too small to allow it to do so, prolonged traction, either on the legs or with forceps, must not be indulged in. The child will, in all probability, be dead, but, alive or dead, the head should be perforated, and the brain evacuated. This may be done behind the ear, or through the roof of the mouth. Vigorous traction may not only break the neck, but even cause decapitation, a very serious accident to happen, as the utmost difficulty is experienced in delivering a decapitated head, especially if the pelvis is contracted. Under no consideration should the neck be severed. I have more than once known this to be done in hopes that the head could then be easily grasped with forceps, but with dire results. If such an accident happens, the head should be perforated and delivered with the cephalotribe.

Malrotation of the Head.—The chin rarely passes to the front. This can be prevented during the delivery of the body. If it has passed forwards, the body of the child must be swung backwards instead of forwards, and the chin and face brought out under the pubic arch. This may be assisted by making pressure on the occiput through the rectum, so as to flex the head. Forceps are not very useful in these cases. They will not promote delivery in the natural way, unless applied the reverse way. The chin is said occasionally to hitch above the symphysis, and the occiput then descends into the hollow of the sacrum. In such a case, the occiput must necessarily pass over the perineum first and the face be born last, the child looking directly into the vagina as birth is completed. A small head might escape in this way, but the strain upon the perineum would be very great. Forceps could be applied behind the body of the child, so that the occiput would lie between the shanks, but in most cases perforation would be necessary. The child would very probably be dead. If it were dead, one should perforate at once, without attempting to deliver it by traction.

CHAPTER XXVI

PRÆTERNATURAL LABOURS—*Continued*

Transverse Presentations—Positions—Mechanism—Spontaneous Rectification—Spontaneous Version—Spontaneous Evolution—Spontaneous Expulsion.

Transverse Presentations.—The long axis of the fœtus lies more or less transverse to the long axis of the mother. Some part of the trunk presents, and, as it is most frequently the shoulder, these cases are often spoken of as shoulder presentations. The hand, arm, elbow, shoulder, or ribs may be the part felt. The arm may be prolapsed into the vagina.

Causes.—Prematurity, death of the fœtus, excessive liquor amnii, placenta prævia, twins, tumours, and obliquity of the uterus are all causes.

Premature and mature fœtuses with excessive liquor amnii move about freely in the uterine cavity, and have a tendency to present transversely. The same thing is likely to occur with a dead fœtus, as it is much more flexible than a living one, and any part of the body may be driven down instead of the head. With placenta prævia, you have both the shape of the uterine cavity altered and the prematurity of the labour as predisposing causes. With twins, one or both are liable to be transverse from the altered shape of the uterus. At full time, obliquity of the uterus is the most frequent cause. The cause of the obliquity may be a tumour or a contracted pelvis, so these may be considered together. When the uterine axis is oblique, the long axis of the fœtus will be oblique, and the head will lie in the iliac fossa of the side opposite to that towards which the fundus leans. If the head is so far over that the occiput cannot enter the brim as the uterine contractions force the fœtus down, a face or a transverse presentation results. If the body is lying so that extension of the head can occur, the face will come into the brim, but if it is so placed that extension cannot occur, the shoulder, or some part of the body, will enter.

Frequency.—Transverse presentations occur in about one in 200 cases.

Diagnosis.—The abdomen will appear broader than natural, and, on palpating it, the long axis of the uterus will be found to lie more or less transversely to the long axis of the mother. The rounded head will be felt at one side and the breech at the other. If it is dorso-anterior, the back of the child will be felt to the front, and, if it is dorso-posterior, the limbs will be made out to the front. The fœtal heart will be heard low down.

Per vaginam the presenting part will be felt high unless the hand or arm is prolapsed. If the membranes are unruptured, they will protrude in a sausage shape. When the presenting part is high it will be soft. If it is the shoulder, three bony ridges can be recognised—viz., the clavicle, the humerus, and the spine of the scapula—radiating from one spot. If the finger can be passed into the axilla, the ribs can be felt, and this will distinguish it from the fold of the groin in a breech presentation. If the hand presents, it can easily be recognised from the foot by the absence of the heel, the difference between the length of the fingers and thumb, and the freedom with which the thumb can be bent over the palm, or extended at right angles to the hand. The elbow can be diagnosed from the knee by its pointed extremity, with a hollow at each side, instead of a hollow in the centre, with a prominence at either side. If you are in doubt, try to reach the hand or foot. When the side of the chest presents, the ribs can be easily distinguished. The cord is very liable to be prolapsed.

Prognosis.—The risk to the mother is very great if the case is left to nature, but if it is properly treated early, there should not be very much risk. The woman may die of exhaustion, of rupture of the uterus, from the result of operative interference, or from hæmorrhage or sepsis. The risk to the child is exceedingly great. A living, full-time child can hardly be born alive by natural efforts. Besides the risk of pressure interfering with the placental circulation, you have all the risks of artificial delivery by turning. By proper treatment the risk to the child is lessened, but in all cases it is great.

Positions.—The shoulder or acromion process is the denominator, and four positions, corresponding to the vertex ones, are given. As in pelvic presentations, they may be divided into two main divisions—viz., two dorso-anterior and two dorso-posterior positions—*i.e.*, a right and left dorso-anterior, and a right and left dorso-posterior; right and left, anterior and posterior referring to the mother.

1. Dorso-anterior, Left Acromio-iliac = Left Acromio-anterior, L.A.A.
2. " " Right " " = Right " " R.A.A.
3. Dorso-posterior, Right " " = Right Acromio-posterior, R.A.P.
4. " " Left " " = Left " " L.A.P.

Course of the Labour.—If the child is small, or dead and softened, the labour may end in its expulsion in one of the ways to be described, but if it is large, alive, or only recently dead, the uterus may rupture, or the contractions of the uterus may entirely cease and the labour pass off. This last is a very fortunate termination, if there is no assistance at hand. The child will be dead before this happens, and if the woman does not die of exhaustion, labour will come on again in a few days, when the child will be softened, and may be expelled quite easily. A small, flexible child is occasionally expelled alive, as in premature cases or a second child of twins.

MECHANISM.

1. **Spontaneous Rectification.**—The fœtus very rarely lies absolutely transversely, but is usually oblique, with the head in one iliac fossa and the shoulder over the brim. The head can be felt bulging out the side of the uterus. If the fœtus is freely movable, as the uterus contracts, the head may be pushed towards the axis of the brim, and thus become substituted for the shoulder; in other words, rectification may occur. This probably occurs more frequently than we are aware.

2. **Spontaneous Version.**—This method was first described by Denman under the name of "Spontaneous Evolution." The arm may or may not be prolapsed. If it is, it will not be wholly outside the vulva. The body is still in the uterine cavity, the head being jammed tightly into one iliac fossa. The doubled-up body is too large to pass through the brim. As the uterus contracts firmly, it presses upon the breech, which is the highest portion of the fœtus. The breech is the only part which is at all movable, and it is gradually driven downwards until it is forced through the brim and is expelled. The body turns on its own axis. The case then finishes like an ordinary breech. An ordinary-sized living child, or one very recently dead, may be expelled in this way. If it has been dead sufficiently long to be softened, it will come through doubled up. For spontaneous version the child must not be too large, and it must have a certain amount of resilience. It takes place later in labour than spontaneous rectification, but, like the latter, occurs in the uterus, and not in the pelvis. It is supposed to be due to irregular contrac-

tions of the uterus, the firmly contracting portion pushing the breech down, while the relaxed portion allows the head to pass up.

Case.—Mrs. K., aged twenty-seven, 6-para, was seen by a student, who found the hand in the vagina. The pains were strong. When the house-surgeon reached the case he found the hand was at the vulva, but before he could make a vaginal examination a very strong contraction came on, and the breech was driven down, and the body born dorso-posterior. The head was retained for a little under the pubic arch, but the child was delivered alive. It weighed 4¾ pounds, and the mother stated it was about a month before its time. The labour had lasted fifteen hours, and the membranes were said to have ruptured twelve hours before the case was first seen.

3. **Spontaneous Evolution (Douglas).**—This occurs in the pelvic cavity. The presenting shoulder is forced very low down and forwards under the pubic arch. The entire arm and shoulder can be seen, and the clavicle lies under the pubic symphysis. The head is above the pubis, bulging well forwards. As the uterine contractions go on, the side of the chest is forced forwards, and the ribs can be felt at the vulva. The clavicle is driven round the anterior part of the symphysis. The breech is now either in the hollow of the sacrum, or coming through the brim. Further contractions will drive it down and force it free, and the labour will finish like an ordinary breech.

Spontaneous evolution occurs in the cavity of the pelvis, thus differing from version, which occurs in the uterus. The uterine contractions must be very powerful. A full-time child may be born alive in this way if it is small and the pelvis roomy, but the great pressure to which the child is subjected is apt to cause its death.

4. **Spontaneous Expulsion.**—This only happens with macerated fœtuses. The body is forced through doubled up, the head and legs being expelled together last. This method is seen with premature macerated fœtuses, and in those neglected cases in which there has been a cessation of labour a few days previously, and the fœtus has had time to become softened.

Treatment.—If the membranes are not ruptured, they must be kept intact as long as possible. Spontaneous restitution should be assisted by external manipulations. If the membranes have ruptured, dilatation should be assisted by means of hydrostatic bags. Champetier de Ribes' bag does admirably, as it effectually retains the remainder of the liquor amnii in the uterus, and thus lessens the pressure upon the child. In cases where the membranes are intact, if the head cannot be manipulated into the brim, version should be done as soon as the os is fully dilated. The bipolar method may be used, but the ordinary internal podalic is the one most frequently adopted. If the membranes are ruptured and the os fully dilated, podalic version should be done at once, before the uterus gets retracted round the child. If the os is not fully dilated, it should be dilated, by bags or manually, and version should then be done. In these cases the patient must be very deeply anæsthetized, to get as much relaxation of the uterus as possible, in order to lessen the risk of rupture. If any retraction has taken place, Bandl's ring will form a ledge round the interior of the uterus, and the shoulder will be fixed under it. It should be released before the body is turned, or it may very easily rupture the uterus.

In doing podalic version, some authorities advise catching the nearer foot and others the farther off one. The proper foot to be caught will depend upon the position of the child, whether it is dorso-anterior or dorso-posterior. In dorso-anterior cases the nearer foot should be caught, while in dorso-posterior it should be that further away. In the dorso-anterior the back is already to the front, and you do not wish to alter this, therefore seize the nearer foot. In the dorso-posterior cases you seize the farther away foot, as you not only wish to turn the child, but also to bring its back to the front. If you seize the nearer foot, you will turn the child just as easily, but you will not rotate it on its long axis, so the back will remain dorso-posterior.

When impaction has occurred, and the uterus is firmly moulded round the child, version should not be attempted. The child will be dead, so no risk should be run in its interest. Embryulcia or decapitation should then be done. If the neck can be reached, it should be cut through. The body can then be delivered, and the head afterwards by means of forceps or the cranioclast. If the neck cannot be reached, break into the body, and cut the spine across, and deliver the body.

CHAPTER XXVII

COMPLEX OR COMPLICATED LABOURS

Fœtal Complications—Prolapse of the Cord—Multiple Pregnancy—Twins—Varieties—Superfecundation—Superfœtation—Arrangement of Deciduæ and Membranes—Course of the Pregnancy—Triplets—Locked Twins—Breech and Head—Breech and Transverse—Head and Transverse.

FŒTAL COMPLICATIONS.

Prolapse of the Cord.—This accident is much more common in multiparæ than in primiparæ. It occurs about once in 150 cases. The term "funic presentation" is sometimes applied to it when the cord is in front of the presenting part, before the membranes have ruptured, and "funic prolapse" if it descends after dilatation, when the membranes are already ruptured. This is a useless distinction.

Causes.—It may be met with in an ordinary, vertex presentation, but is much more common in contracted pelves and malpresentations. It is apt to arise in any case in which the presenting part does not fully fill up the brim before the membranes rupture, as the rush of waters may carry the cord down, especially if it is long or inserted low down.

Diagnosis.—Before the membranes rupture it can be felt inside of them, and there should be no difficulty in recognising it, especially if it is pulsating. In the majority of cases the membranes are ruptured, and the fingers can be hooked round a loop. It often protrudes at the vulva. Always note whether it is pulsating or not. More than once a coil of the woman's intestines, which had prolapsed through a rupture of the vagina, has been mistaken for the cord. The intestines have actually been drawn down and several feet cut away. No sane person should ever make such a mistake, but it has unfortunately happened.

Prognosis.—It does not add any risk to the mother other than that she runs from the abnormal presentation or condition which causes the prolapse, except that the delivery will have to be rapid to save the child, and in this way the mother's risk may be increased. The risk to the child is very great. At least one-third of the children are lost from compression of the cord.

Treatment.—If the cord is pulseless and flaccid, showing that the child is dead, leave it alone. To make sure that pulsation has absolutely ceased, examine between the pains. You may be misled if you only examine during a pain, as the pressure upon the cord may stop the circulation during the continuance of the pain. If it is pulsating, try to replace it above the presenting part. Placing the patient in the genupectoral position will assist this. If it cannot be replaced before the membranes rupture, the best treatment is to do bipolar version.

If the membranes are ruptured, and the cord is pulsating, try to replace it by pushing it up with the fingers or by means of a loop ot string and a catheter, but if it has been protruding at the vulva, be careful to wash it first, to prevent septic infection of the uterus. If it cannot be kept up, it may be placed in whichever side of the pelvis there will be the least pressure upon it. If it is being pressed upon, delivery by forceps or turning must be at once resorted to. If necessary, the cervix should be manually dilated. The delivery must be quickly done, in the interest of the child.

Multiple Pregnancy.—In Britain twins occur about 1 in every 100 pregnancies. In Ireland the average is about 1 in 60. They very frequently run in families—*i.e.*, the tendency to twin-bearing is hereditary. This hereditary influence may operate through the father as well as the mother, as the same man is often the father of twins by different women, and brothers have frequently been the father of twins by women in no way related. They are commonest in first pregnancies, especially in elderly women. Imbeciles, idiots, and children with bodily deformities, are not infrequently found in twin-bearing families.

Varieties.—Each may be developed from a separate ovum (*binovular*), or both may come from one ovum (*uniovular*). In the first the sexes may differ, but in the second they will be the same.

1. *Binovular.*—The two ova may come from one ovary, as shown by there being two corpora lutea in the ovary, but in some cases there is only one corpus luteum, which shows that two ova may come from one ovisac. A corpus luteum in each ovary shows that an ovum has come from each ovary.

Fertilization of the two ova may take place at one time, or at two different times within a short period of each other. This latter fact has been proved by the birth of a white or a black twin where the two ova have been impregnated by a white and a black man respectively. This condition is known as *superfecundation*. We have no means of judging of the frequency of its occurrence. An analogous condition of so-called *superfœtation* is said to occur at times where the second ovum is impregnated some months later than the first. The birth of a mature and an apparently premature child at one time, or the birth of two children within a month or two of each other, has been held as proving that this condition can exist, but until the possibility of the existence of a double uterus in such cases has been disproved, I cannot admit that superfœtation can arise. In some of the supposed cases a double uterus has been found. Each half of the uterus has become impregnated at different times, a condition which might easily happen, as ovulation continues during pregnancy. Besides the condition of two ova developing, one in each side of a double uterus, two have been found, one in the uterus and one in a Fallopian tube, two in one Fallopian tube, and one in each Fallopian tube.

Arrangement of the Deciduæ and Membranes.—1. *Binovular Twins.*—At first the decidua reflexa may be double, but at the end of pregnancy this cannot be made out. Each ovum has at first a complete and separate chorion, and these may remain separate to the end of the pregnancy, but the portions which lie together may fuse and disappear, so that at full time there is apparently a single chorion. Each fœtus has, of course, its own amnion, and the two sacs remain separate throughout, except in extremely rare cases, where they may possibly fuse. Binovular twins at full time may be in distinct bags of membranes, and the placentæ be quite separate. There may be a single chorion, but the amniotic sacs will be separate, except in very rare instances. The contiguous edges of the placentæ may be apparently united, but there will be no communication between the vessels.

Binovular twins are much more common than uniovular, and are more frequent in multiparæ than in primiparæ. As already stated, they may be of the same, but are more frequently of different, sexes.

2. *Uniovular twins* are developed from a single ovum, which may have two blastoderms, or a single blastoderm which divides into two portions. Each blastoderm, or division, develops into a fœtus. They are always of the same sex. If complete division of the blastoderm does not occur, a double monster results. The arrangement of

the reflexa and membranes will be a single reflexa and chorion, and in some cases a single amniotic sac, or each fœtus may have its own amnion. In the majority of cases there are two amnions. There is a single placenta with, as a rule, separate cords, but they may be united before they are inserted into the placenta. There is always a communication between the two fœtal circulations.

Uniovular twins perish prematurely much more frequently than binovular, and abnormalities are very common. When one embryo is less developed than the other, the heart of the stronger may force the blood up the umbilical arteries of the weaker, and so disturb the circulation as to cause atrophy of the heart of the weaker, resulting in an *acardiac monster*. The lower part of the monster, being nourished by the blood forced along the umbilical arteries, develops, while the heart and upper part, not being sufficiently nourished, cease to develop, and often remain as a mass of undifferentiated tissue. The lower limbs will be more or less normally developed, but the upper limbs and head will be entirely wanting. The stronger embryo may have some abnormality as well, such as an encephalocele.

Course of the Pregnancy.—In more than half the cases premature delivery occurs. One fœtus may die and be expelled, and the other remain *in utero* until full time, but more frequently the dead fœtus is retained. The pressure of the growing ovum may flatten out the blighted one, and give rise to a *papyraceous fœtus*. I have seen a good many of these cases, but in none of them was the fœtus flattened out, only macerated. In three of the cases, I treated the patients for threatened miscarriages about mid-term, when the fœtus had evidently perished. In one of them the woman had been kicked in the abdomen, and in another she suffered from paraplegia (see p. 63). Hydramnios is common with twins, and also vesicular degeneration of the chorion, the so-called *hydatid mole*. When the twins are in one sac, the cords may become so twisted and knotted as to cut off the circulation, and cause the death of both fœtuses. Albuminuria is very common, and œdema of the legs and vulva may become extreme, largely from the pressure, as the following case illustrates: The patient, pregnant for the second time, began to suffer very much from œdema of the legs. About six weeks before full time albumin first showed itself in the urine, but not to any extent. She was kept on a diuretic, but the swelling rapidly increased, and the urine diminished to about 25 ounces per diem. When I saw her, she had excessive œdema of the legs and abdominal wall. The uterus was very large. I suspected twins, but could only palpate one fœtus and hear one fœtal heart. The patient was within four weeks of full time. The diuretic treatment was continued, and she was put upon a milk diet. Saline purgatives were also freely administered. The albumin was about one-tenth, and there were no tube-casts. The urine quickly increased in amount until by the sixth day she was passing more than 65 ounces. The swelling of the legs and abdomen did not decrease, and the labia began to swell, so I determined to bring on labour. This was easily accomplished, as the os admitted the largest Barnes' bag. When the bag was expelled I ruptured the membranes, and a couple of hours later delivered a large child by forceps. A second, much smaller, child was found lying in the back of the uterus, which accounted for its not having been felt by palpation. It was transverse, so I turned and delivered it also alive. There was a single placenta with separate amniotic sacs. The twins, males, had been uniovular. By the fourth day after delivery the œdema had completely disappeared.

Diagnosis.—In most cases, the diagnosis of twins is only made after the first child has been born. If the placenta of the first one comes away in the usual time, the second child may be left *in utero*, to be expelled a few hours or days later. I have known this to occur twice in the hands of midwives, but such a mistake should never be made by a competent person. On inspecting the abdomen in twin cases, the uterine tumour will be found to be larger and broader than usual, and sometimes a groove can be noticed. By palpation you may be able to make out two heads and more limbs than in an ordinary case. If two fœtal hearts can be made out, with separate points of maximum intensity and a difference in rates, you may be absolutely sure of the diagnosis. If, however, one child lies directly behind the other, and there is a considerable amount of liquor amnii, you will not be able to palpate the posterior child, nor can you hear its fœtal heart.

Presentation.—In nearly half the cases both heads present, and in about a third a head and a breech; then come both breeches, head and transverse, breech and transverse, and, least frequently, both transverse.

Triplets are exceedingly rare, perhaps once in 10,000 cases, while quadruplets are much rarer. Quintuplets have been recorded, but there are no authentic cases of more than five. Triplets may arise from separate ova, or from two ova, two from one and the other single. The membranes and placentæ will be arranged according to the ova.

Premature labour is almost sure to occur.

Prognosis.—The risk to the mother is considerably greater than in single pregnancies. During pregnancy there is a greater strain thrown upon the kidneys, so albuminuria is apt to occur. Premature labour is frequent. During labour there is risk from delay in the first stage, due to the overdistention, and in the third stage there is much greater risk, from post-partum hæmorrhage. This arises from the large placental site, and also from inertia uteri, following on the overdistention and prolonged first stage. Artificial delivery in the interests of the children may also add to the risk. The prognosis for the children is not nearly so good as in single births. If there is much delay between the births, the risk to the second child is materially increased; therefore one should take steps to deliver the second child, if uterine effort does not expel it within an hour.

Treatment.—If the uterus is much overdistended, it may be necessary to rupture the membranes early. If two bags present, one containing a head and the other a breech, the one containing the head should always be ruptured first, to allow the head to descend and prevent locking. The first stage is liable to be prolonged from the overdistention. Unless there is some obstruction, the second stage, as a rule, will be short, as the children will be small. When the first child is born, the cord must be tied in two places, so as to prevent hæmorrhage from the end next the mother. There may be a single placenta, and, in that case, if the cord is not tied, the second child will quickly bleed to death. The uterus usually remains quiescent for half an hour or so before contractions set in again. If the second child presents, either by the head or breech, rupture the membranes if necessary, and then wait for half an hour, gently kneading the uterus to stimulate it. If the second child is transverse, do not wait, but turn it at once. If there are no indications of uterine action in about half an hour, take steps to deliver the second child by forceps or turning. As the second child is being expelled, the uterus must be carefully followed down with the hand, and after the placenta is expelled active compression must be kept up for a considerable time, to guard against post-partum hæmorrhage. Ergot should be given. In every case you must be prepared to deal with post-partum hæmorrhage, so a hot douche and ergotin should be ready for use; but the great thing is to prevent its occurrence by keeping the uterus compressed. There may only be one large placenta, or two smaller ones. If they are separate, the placenta of the first child may come away before the second child, but, as a rule, both placentæ are retained until the second child is born. Rarely both placentæ are expelled before the second child.

Malpresentations are common with twins. One or both may show this. They must be dealt with as with single births, only care must be taken not to cause locking; for instance, if you should meet with a head and a transverse case, the head presentation should, if possible, be dealt with first, for, if you turn the transverse one, the heads may very readily become locked. The malpresentation is most frequent in the second child, and as the parts are well dilated, it can easily be dealt with. It should be dealt with at once.

Locked Twins.—This may occur in several ways, either with both heads presenting, a breech and a head, a breech and a transverse, or a head and a transverse. With both heads presenting, it arises when one head enters the brim and the other follows along with the chest. If there is not room for the head of the second child, and the chest of the first, to pass, they become jammed. If the children are small they may be delivered by natural efforts, but, as a rule, assistance will be required. The first child may be delivered by forceps, but considerable force will be required. Try to push the head of the second child out of the way before making traction. If you cannot effect delivery in this way, one of the children must be sacrificed, and as the first one will probably have suffered from the traction, the second one would be the more likely to survive; therefore break up the head of the first and remove it entirely, if possible, and deliver the second one by forceps.

Breech and Head.—When the breech of the first child is born, the two heads attempt to come through the pelvis together, and thus lock. They may lock chin to chin, chin in the nape of the neck, occiput in the nape of the neck, or head against the side of the neck. If the children are small they may come through locked, as in the following case: A 2-para, aged twenty-one, at the seventh month expelled a small body, but the head stuck. When I was called to her the body was born, but the arms were not down. I freed them easily, as they were only caught at the vulva, and a strong pain immediately expelled the two heads, locked chin to chin. The children were both alive, but too premature to survive.

If the case is seen before the membranes have ruptured, the bag containing the head should be ruptured, to allow the head to descend first and prevent locking. If the locking has occurred and the uterine contractions are not very strong, you may be able to unlock them by pushing up the partly-born child, and then pushing the head of the second out of the way. If you cannot do that, decapitate the first child, and push its head back, and apply forceps to the second and deliver it. The severed head must then be delivered by forceps, cephalotribe, or crotchet. The first child will probably be dead, and at all events it cannot be saved, so one need have no compunction in decapitating.

Breech and Transverse.—If seen early, turn the transverse child, and thus prevent impaction. If impaction has occurred, press aside the transverse child, so as to unlock the head, and then deliver the first by traction and turn the second. If you cannot do this, decapitate the first, and turn the second, and deal with the severed head afterwards.

Head and Transverse.—Push the transverse one out of the way, and deliver the first by forceps: then turn the second. In dealing with a case of this kind, before impaction, it will manifestly not do to turn the transverse one and attempt to deliver it first, as the heads may easily lock. It would be quite easy, however, to push the transverse one out of the way, and apply forceps to the head of the other.

In doing version on the first child, in twin cases, one must always bear in mind the possibility of the after-coming head being locked.

CHAPTER XXVIII

COMPLEX OR COMPLICATED LABOURS—*Continued*

Maternal Complications—Cardiac Disease—Management of Labour—Cases—Aortic Stenosis—Aortic Stenosis with Mitral Stenosis and Incompetence—Mitral Stenosis—Mitral Stenosis and Incompetence—Mitral and Tricuspid Incompetence.

MATERNAL COMPLICATIONS.

Cardiac Disease.—Cardiac disease has already been dealt with in reference to pregnancy. It is a serious complication during pregnancy, but the acme of risk is reached during labour. While pregnancy throws a continuous strain upon the heart, this is markedly increased during labour, so that a heart which has just been able to carry on its work, and no more, may very easily be overpowered by the extra strain of labour. While there is risk of failure of the heart during the actual stress of labour, there is also considerable risk of its being paralyzed immediately after the birth of the child. This is specially seen in cases where the right side of the heart is very much dilated, as with mitral stenosis. When the second stage of labour is over, the retraction of the uterus cuts out of its circulation the greater part of the uterine blood, and this is returned to the heart unless a considerable amount of blood is lost post partum. The result is overdistention of the right side of the heart and paralysis of the organ (Fig. 46). If this explanation, which Berry Hart so strongly insists on, is the true one, manifestly post-partum bleeding should be encouraged in all cases where the right side of the heart is dilated. I thoroughly agree with Hart in this matter, and have always pursued this method in dealing with such cases. To this I ascribe my success. Hart urges that if cardiac embarrassment comes on, and there is no post-partum hæmorrhage, one should not hesitate to open a vein in the arm. I have never had to do this, but would be prepared to do it in a suitable case.

Prognosis.—The late Angus Macdonald and other writers give a very gloomy prognosis. For my part, I cannot agree with them. It is certainly a dangerous condition, but if compensation is good, and if proper treatment is adopted, the patient should in the majority of cases be carried through. Pure mitral stenosis is said to be the most deadly of all, but this has not been my experience. I should have more fears of a double aortic case. Aortic incompetence comes next to mitral stenosis. Mitral incompetence is not very serious, unless it is very marked. I have seen a number of cases of fairly marked mitral incompetence where the patients passed through several labours without any inconvenience. We not infrequently discover cases of this kind in the wards, after labour is over, where there has been no indications of anything having been wrong during the labour. Two lesions combined, such as aortic and mitral, or mitral and tricuspid, are more serious than a single one. Repeated pregnancies are bound to tell on the heart in the long-run, and patients should be warned of this.

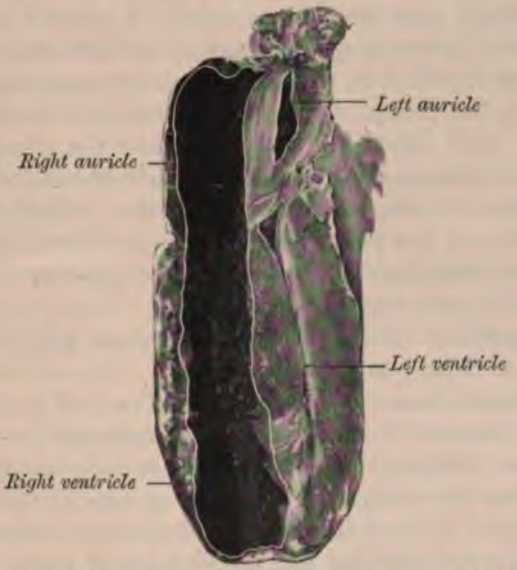


FIG. 46.—SECTION OF HEART WITH MITRAL STENOSIS IN A CASE OF SUDDEN DEATH AT END OF LABOUR (HART).

Management of Labour.—At the commencement of labour the patient should be given a large dose of digitalis or strophanthus. The first stage should be allowed to run its course naturally, provided it is not too prolonged, and that no cardiac embarrassment begins to manifest itself by cyanosis and difficulty of breathing. If the patient is becoming exhausted, or the heart embarrassed, artificial dilatation and immediate delivery should be resorted to. There is no risk in giving chloroform, but in some cases ether is preferable. When the os is once fully dilated, artificial delivery should be done. As soon as a patient passes into the second stage of labour and begins to bear down, the strain upon the heart is enormously increased; therefore the second stage should be done away with, or cut as short as possible. This can easily be done by applying forceps or turning. During the third stage the uterus should be allowed to relax, and bleeding should be encouraged. Ergot is therefore contra-indicated. If the patient should show marked cardiac embarrassment, and very little blood be lost post partum, a vein in the arm should be opened, and enough blood allowed to flow to relieve the engorgement. If there is much collapse, strychnine and digitalin should be given freely hypodermically. During the puerperium the cardiac tonic should be continued, and the patient should not be allowed to suckle her child, not only because she will be weak, but also because lactation has a bad effect upon a damaged heart.

Cases.—Several cases have already been given fully in treating of cardiac disease in pregnancy, which see.

CASE I.—*Aortic Stenosis; Labour at Full Time.*—J. C., aged twenty-six, 2-para. Admitted December 30, 1901; delivered January 8, 1902.

This patient was not in labour when admitted, but on account of cough, extreme breathlessness, and great œdema of the legs, it was deemed advisable to keep her under observation in hospital.

Previous history: She had had scarlet fever at seven years of age, from which she had made a good recovery, but for the past eight years she had been much troubled with rheumatic pains in her joints. Three months ago the cough and breathlessness had set in, and the breathing had become exceedingly embarrassed on exertion. She had had no difficulty during her former pregnancy.

Cardiac condition on admission: The pulse was 80, and of fair tension. The apex-beat was ½ inch outside the vertical nipple-line. The right border was normal in position. Auscultation revealed a harsh systolic murmur, heard with maximum intensity over the aortic area, and conducted into the vessels of the neck. A very slight thrill could be occasionally detected over the aortic area.

The swelling of the legs and ankles was extreme, and there was very marked degree of capillary varicosity of the veins.

The urine was pale straw-colour, with a slight deposit of urates, but no albumin.

She was kept at absolute rest, and given an expectorant, and cardiac tonic.

Labour set in on the night of January 8, and, although strict injunctions had been given that the resident was to be advised of the fact, no intimation was given him until the second stage had lasted three hours, and no progress was being made. He found the patient was completely exhausted, with an irregular pulse of 120. The pains were very feeble. An inhalation of amyl nitrate was given, and a hypodermic injection of strychnine $\frac{1}{30}$ grain, and digitalin $\frac{1}{50}$ grain. Delivery was effected by forceps under chloroform. Free bleeding was allowed to take place post partum, and then the uterus was firmly rubbed till it became well retracted.

The patient made a good recovery.

CASE II.—*Aortic Stenosis with Mitral Stenosis and Incompetence; Labour at Full Time.*—Mrs. A., aged twenty-five, 3-para. Admitted December 15, 1901; delivered January 2, 1902.

This patient was admitted to hospital suffering from cough, breathlessness, and palpitation, dating from the quickening, but aggravated during the fortnight prior to admission. She had also been very hoarse for three weeks.

Past history: She had never had scarlet fever or rheumatic fever, nor had she ever manifested any symptoms of subacute rheumatism. During her first pregnancy she had been perfectly well, but had suffered slightly from breathlessness during the latter third of her second. There was no indication of syphilis.

Inspection of the cardiac area revealed diffuse pulsation in the fourth and fifth interspaces, while marked pulsation could be detected in the suprasternal notch and in the veins of the neck.

Palpation revealed marked pulsation in the second, third, fourth, and fifth interspaces, accompanied by a well-defined thrill of a rough, grating character, and preceding the apical impulse.

On percussion, the transverse area of cardiac dulness was found to measure 4¼ inches, and this was continued upwards, and towards the middle and left of the manubrium sterni, by a narrow neck, 1½ inches broad.

Auscultation over the mitral area gave a rough, rumbling murmur, limited in distribution, and running up to the first sound, which was obscured by a soft, blowing, systolic murmur, following upon the termination of the presystolic one. The systolic murmur was well conducted into the left axillary region. Over the aortic area and midsternum a somewhat harsh systolic murmur was heard; it was conducted into the vessels of the neck.

The aphonic condition, associated with the pulsation in the suprasternal notch, and the area of percussion dulness over the upper and left border of the sternum, led to a suspicion of aneurism; but although a systolic murmur could be heard over the trachea, there was no evidence of pupillary inequality, inequality of radial pulses, dysphagia, or tracheal tugging. Laryngoscopic examination showed a somewhat anæmic condition of the larynx, and a tumefaction of the vocal cords and of the aryepiglottic folds. Movements of adduction and abduction of the vocal cords, though a little tardy, were quite free.

Lungs: Bronchitic râles were heard in the left. The pulse was 90, and slightly irregular. The urine contained 0·5 per cent. albumin and triple phosphates.

The patient was kept in bed on milk diet and imperial drink, and given a mixture containing strophanthus, acetate, and citrate of potash. She was also given an inhalation of menthol and tr. benzoini co. Her condition quickly improved. The pulse became regular, and the heart's action quietened, while the cough and aphonia lessened. Every night she complained of pains in the lumbar region, which seemed to be false labour pains.

On January 2 labour set in with strong pains. The first stage only lasted an hour and a quarter, and the second only eighteen minutes. No instrumental interference was adopted, as there was no cardiac embarrassment. A fair amount of bleeding was allowed in the third stage. She made a good recovery.

Case III.—*Mitral Stenosis; Labour at Full Time.*—Mrs. W., aged twenty-nine, 1-para. Admitted December 19, 1901; delivered December 19. This patient on admission felt very well, and suffered no discomfort. Lividity of the ears, lips, cheeks, and tip of the nose led to the suspicion of a mitral lesion, and auscultation revealed a well-marked presystolic murmur in the mitral area. The thrill could be distinctly felt.

As the second stage was prolonged, chloroform was administered and forceps applied. Free bleeding was allowed to take place. She made an uninterrupted recovery.

In this case there must have been well-marked compensation, as she had not suffered any inconvenience during the pregnancy. During the labour there was nothing to show that the heart was affected. I think it was probably a case of congenital stenosis. I know of a case of mitral stenosis, which I believe to be congenital, where two labours have been passed through without the least difficulty.

Case IV.—*Mitral Stenosis and Incompetence; Labour at Full Time.*—Mrs. B., aged twenty-seven, 2-para. Admitted to the hospital December 17, 1901; delivered December 18. On admission the patient was very pallid, and presented considerable œdema of the legs and vulva. For a month prior to admission she had suffered from headache, vertigo, sickness, and transient amaurosis. The symptoms, coupled with the œdema of the legs and genitalia, led to the examination of the urine, which was found to be of a pale straw-colour, but without a trace of albumin.

On examining the heart, a pronounced presystolic thrill could be felt, and a well-marked presystolic and a systolic murmur heard over the mitral area.

The os was sufficiently dilated to admit two finger-tips, but the pains, although recurring frequently and strongly, were not having much effect on the cervix. As the patient had a very pendulous abdomen, a firm binder was applied. This did not cause any cardiac discomfort.

A hypodermic injection of digitalin and strychnine was given on admission, and digitalis and strophanthus by the mouth every two hours afterwards. The pains became feeble and occurred at long intervals, so 10 grains of quinine were given to stimulate the uterus. Two hours later the pains became stronger, the os dilated very slowly, and as the patient was becoming worn out, a mixture of chloroform and ether (2 to 1) was administered; the remainder of the dilatation was finished manually, and delivery effected by forceps. There was very little bleeding. The patient was very weak after delivery, but there was no cardiac embarrassment.

The cardiac tonic was continued throughout the puerperium, and the patient was not allowed to nurse. She left the hospital feeling very well.

Case V.—*Mitral Stenosis and Incompetence—Albuminuria; Labour at Full Time.*—Mrs. W., aged twenty-four, 1-para. Admitted December 23, 1901; delivered December 27. This patient was admitted on account of œdema of the feet, legs, face, and vulva. She had not suffered from any discomfort, beyond that due to the swelling in the parts. The urine, which was scanty in amount and high-coloured, was loaded with albumin. Esbach's albuminometer gave 0·8 per cent.

Percussion of the area of cardiac dulness revealed a transverse measurement of 4¼ inches. A well-marked presystolic thrill was felt over the mitral area, and auscultation elicited a presystolic and a systolic murmur over that region. There was, in addition, a slight whiff after the second sound in the diastolic period, followed with an interval with no murmur, and then a harsh, rumbling murmur running up to the first sound. There was no evidence of an aortic lesion, and the diastolic soft murmur before mentioned was only audible over the mitral area.

She was given saline purgatives, imperial drink, digitalis, and strophanthus. The urine increased in quantity, and the albumin fell on the third day to 0·5 per cent., Esbach.

Labour pains set in four days after admission. The labour was terminated under chloroform by forceps. Slight bleeding was allowed to take place. There was no cardiac embarrassment. She made an uninterrupted recovery. The albumin had completely disappeared from her urine.

Case VI.—*Mitral and Tricuspid Incompetence; Labour at Full Time.*—J. F., aged twenty-six, 2-para, was admitted to the Glasgow Maternity Hospital on February 6, 1901, in labour.

Previous history: The patient had been in feeble health for some time past. She had had a bad attack of chorea in childhood, recurring attacks of rheumatism, and an attack of scarlet fever. She had suffered for many years from a weak heart. Her doctor had told her "it was only a matter of time with her." She had had a severe cough for a long time. Her previous labour had not, apparently, caused her much trouble.

State on admission: The os was nearly three-quarters dilated. The legs were œdematous. The breathing was rapid and laborious, and numerous râles were heard over the chest. At the apex of the heart a loud, blowing, systolic murmur was heard. The heart was beating forcibly and rapidly.

Two hours after admission the membranes ruptured. The breathlessness became greatly aggravated. Forceps were applied, and a live child easily delivered. Chloroform was not given. She was freely stimulated with whisky and hypodermic injections of strychnine and digitalin. Her breathlessness and distress rapidly increased, and she died five hours after delivery.

The post-mortem examination was performed by Dr. Carstairs Douglas. The pericardium contained a few ounces of fluid, and each pleural cavity also contained about 12 ounces of the same.

The heart was large, and somewhat fatty. The left auricle was dilated, and contained a firm, adherent, ante-mortem clot the size of a bantam's egg. The left ventricle was hypertrophied, and the mitral valve incompetent, with distinct sclerosis of the cusps. A slender ante-mortem clot extended into the aorta. The aortic valves were healthy. The right ventricle was a little dilated, and it and the right auricle contained ante-mortem clots. The tricuspid valve-ring was dilated.

The lungs showed marked œdema, and the left one some brown induration. The liver was nutmeg.

This was the only fatal case in the series. As I was not present, I cannot say whether or not there was any post-partum bleeding. At the post-mortem examination the heart, although somewhat dilated, was not distended with fluid blood, but contained ante-mortem clots. In examining the heart in fatal puerperal cases, I have been struck with the frequency with which one meets with ante-mortem clots. They are nearly always found, no matter what has been the cause of death.

CHAPTER XXIX

COMPLEX OR COMPLICATED LABOURS—*Continued*

Maternal Complications—Eclampsia—Premonitory Signs and Symptoms—The Seizure—Frequency—Diagnosis—Prognosis—Treatment—Cases.

MATERNAL COMPLICATIONS.

Eclampsia as a Complication of Pregnancy, Parturition, and the Puerperium.—Eclampsia, or convulsions, affecting women during pregnancy, parturition, or the puerperium, is usually spoken of as puerperal eclampsia. It will be more convenient to discuss the whole subject in one section than to take it up under the three different headings of pregnancy, parturition, and the puerperium.

From the very earliest days of medicine, the condition has been recognised, and innumerable treatises have been written on it. Yet we have still much to learn, especially as to the causation of the fits. The newer methods of treatment enable us to deal much more satisfactorily with the cases than our predecessors could do, but until we gain a clear conception of what the poison is, and how it acts, our treatment must be empirical, and, to a large extent, unsatisfactory.

Many theories have been advanced, but none of them are satisfactory. I do not intend discussing them, neither do I purpose attempting to add a new one. I shall merely indicate what I consider to be the extent of our present knowledge of the condition.

Pregnancy is a physiological condition, but it borders dangerously upon the pathological. A new element is imported into the woman's economy. The rapidly-growing uterus and its contents have to be supplied with nourishment, and the noxious substances arising from the rapid tissue metabolism which is going on have to be got rid of. The excretory organs of the woman have thus to do double work—*i.e.*, they have to purify the mother's system of her own noxious substances, and also of those arising from the uterine contents. What the products of tissue metabolism are which are formed in the uterus we do not know, but, judging from the rapid growth and development which are taking place, there must be a large amount of them. In the great majority of cases the excretory organs are equal to the task, and no harm arises, but if any of them should fail, the system will quickly become poisoned, and if the poisoning becomes excessive, convulsions will result. The kidneys are the organs to which most attention has been paid. The urine becomes scanty, and more or less loaded with albumin. The urea and uric acid also diminish in amount. The "kidney of pregnancy" seems to me to result from the toxic action of the products of tissue metabolism upon the kidney substance. The toxine acts very like turpentine or cantharidine, and the urine, which is diminished in amount, becomes loaded with albumin and sometimes with blood. The liver is affected, but whether prior to the kidneys or not I cannot say. In some cases it is found in a condition almost like an early stage of yellow atrophy, while hæmorrhages under its capsule or into its substance are quite common (see Frontispiece). The rôle played by the liver in the causation of the disease remains to be ascertained.

The nervous system of a pregnant woman is usually in a more or less unstable condition, much like that which exists in infancy. Very little will upset it. The toxine, whatever it may be, acts as an irritant upon the nerve-centres, and causes headache, disturbance of vision, and finally a furious nerve-storm in the shape of general convulsions.

An attempt has been made to prove that micro-organisms are the cause, but so far no bacillus has been isolated. To my mind, the exciting cause seems to be a chemical substance, which is the result of tissue metabolism, in connection with the development and nourishing of the fœtus *in utero*. Under ordinary conditions, this toxic substance is cleared out of the body, but if it be retained, either from some fault on the part of the liver or kidneys, or of both, the already unstable nervous centres are affected by it, and an explosion occurs. It is a well-known fact that, if the excretory organs can be got to work satisfactorily, an eclamptic seizure can be prevented (see Cases I. and II., p. 31).

If the maternal system is poisoned, one would naturally expect the fœtus would suffer, and there is no doubt that it does. The toxine acts upon the fœtus in the same way as upon the mother. The fœtus is very often killed, and it has been observed to have actual convulsions *in utero*. I have never observed this, but I have twice delivered children in a state of rigidity, as if they had died in a convulsion. If the child is born alive, it may have convulsions within a few days of birth. I have seen several cases. The kidneys of the fœtus are affected in exactly the same way as those of the mother, and albumin will be found in the urine. In several cases in which I was able to obtain specimens of the child's urine, a considerable amount of albumin was present. I have also found the same in the urine of two children where the mothers had had albuminuria, but had been saved from having convulsions by prompt treatment.

It has been asserted that on the death of the fœtus *in utero* the albumin quickly disappears from the mother's urine. My experience has been quite opposed to this, as on six occasions I have delivered macerated fœtuses in cases of eclampsia with highly albuminous urine. In one case the urine became nearly solid on boiling. In these cases acetone will be found in the urine as a product of maceration.

A number of cases have been published where no albumin was found in the urine. I have only once seen convulsions in labour without albumin in the urine, and as that woman was subject to fits, I do not think it was a case of true eclampsia. In the very large number of cases treated by me, albumin has always been found in a fairly large quantity. When a multipara is seized, it will very often be found that the albumin persists after delivery, showing that she is the subject of nephritis, and, if she should die, the kidneys will be found to be diseased. Nephritis in a pregnant woman is almost sure to end in eclampsia, unless active treatment is adopted to keep the kidneys and bowels acting freely.

Recurrence.—It is rare for a woman to have attacks in subsequent pregnancies, and if they occur there is probably some chronic kidney mischief present. In two instances I have treated recurrent attacks (Cases XXVIII. and XXX.). Besides Case XXX., two other cases of recurrence have been dealt with in the hospital—one fatal, a 5-para, had had convulsions at her three previous confinements, and the other, a 5-para, also had had them in all her previous confinements. Olshausen's estimate of 1 per cent. of recurrences is probably very near the mark.

Premonitory Signs and Symptoms.—The patient usually shows more or less œdema of the feet and legs, and the body and face may also be involved. The labia may be very much swollen (Fig. 47). Occasionally there is no œdema, even of the legs, or it is so slight that it is not observed. She suffers from headache, muscæ volitantes, and temporary failure of vision, which in the actual seizure may go on to complete blindness. I have twice seen patients absolutely blind during the labour. One of them recovered and the other died. They both recovered sight after delivery, but the one who lived suffered from impairment of vision in both eyes. Sickness is sometimes complained of, with severe epigastric pain, just before the onset of the convulsions. The urine decreases in amount, and in some cases there may be total suppression. To the naked eye it may present no abnormal appearance, but in some cases, especially immediately before or during the convulsions, it will be seen to be loaded with blood. Albumin will be found present, even to the extent of its becoming solid on boiling. The urea and uric acid will both be decreased in amount. Various kinds of tube-casts, especially epithelial ones, and much epithelial débris will be seen under the microscope.

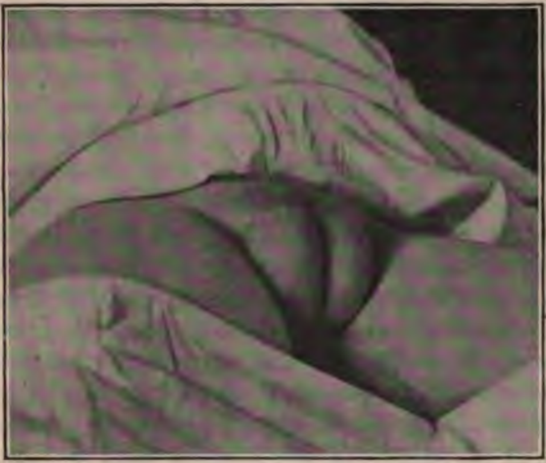


FIG. 47.—ŒDEMA OF THE VULVA.

In the majority of cases premonitory signs and symptoms are present, but occasionally the fits come on without any warning.

The Seizure.—The patient has a dazed, fixed look, the pupils are seen to dilate widely, and twitchings of the eyelids begin, and quickly spread to the facial muscles, the muscles of respiration, and all the other muscles of the body. This clonic stage is succeeded by a tonic one, and then the fit passes off, leaving the patient comatose to a greater or less extent. The tongue or cheek is frequently bitten, unless a folded towel, piece of cork, or rubber, etc., is placed between the teeth. The involvement of the respiratory muscles interferes with the breathing, so the face is suffused, and in bad cases almost black. The breathing will be very stertorous. Froth comes from the mouth, tinged with blood, if the tongue or cheek has been injured. The struggling may be so severe as to make it difficult to keep the patient in bed. The state of coma may pass off in a little, but, in many cases, it persists until another fit comes on. The fits may be few in number, or there may be upwards of a hundred of them. They may recur frequently, or at short or long intervals. If they continue recurring, the coma will gradually deepen. If the patient survives, the coma gradually passes off after the fits cease, but it may be twenty-four or even forty-eight hours before the patient begins to be conscious, and much longer before she is quite clear in her mind. In mild cases there may be little or no coma. The patient's mind is a complete blank from the time of her seizure until she regains consciousness. She knows nothing about the terrible ordeal through which she has passed.

Frequency.—Among ordinary private cases, it occurs in about 1 in 300 cases, but in hospital work it is much more frequent. In the indoor work of the Glasgow Maternity our average is about 1 in 50. As already stated, it is much more frequent in primiparæ, especially among the unmarried, than in multiparæ. It is most frequent during labour, less during pregnancy, and least during the puerperium. It is much more frequent with multiple pregnancies than with single ones. Climatic conditions seem to influence it by interfering with the action of the skin. In our hospital work we generally get a number of cases within a short time of each other. In part of March and April, 1902, I treated six cases within four or five weeks, and in January, 1903, five cases in sixteen days. I give notes of the latter (Cases XXII. to XXVI.).

Diagnosis.—The condition, when once seen, can hardly be mistaken, but one must bear in mind that fits may arise from epilepsy, hysteria, or a brain lesion. The epileptic fits are exactly the same in appearance, but you will get a history of previous epileptic seizures. The presence of albumin in the urine cannot be taken as indicating eclampsia, because you may find it with epilepsy. I have seen such a case, in which, as I got a history of frequent attacks of epilepsy, I did not consider the case one of true eclampsia. With hysterical fits you will have the usual manifestations of hysteria, which are never present in true eclampsia.

In brain lesions you must be guided by the history, the paralysis, the eye conditions, etc. (see Case II., p. 63).

Prognosis.—The condition is undoubtedly an exceedingly serious one. The death-rate given by different authors varies very much. It is very difficult to give anything like an accurate estimate, because one's statistics must be taken from hospital records to get anything like a reliable number of cases, and many cases sent into hospital are beyond hope when admitted. The following estimate is based on eighty consecutive cases treated in the wards of the Glasgow Maternity Hospital. Thirty were fatal, giving a mortality of 37·5 per cent. This is exceedingly high, but it must be remembered that this includes all cases admitted, and many of them had been convulsed for hours, and some were actually moribund at the time of admission. Of the cases treated by the older methods, 44 per cent. died, while of those treated by saline infusions only 24 per cent. were lost. This is a very marked improvement. Of the twenty-two cases given by me in the *International Clinics*, vol. ii., 1901, three died, but one of these deaths was due to a perforating duodenal ulcer on the sixth day. Including this case, it gives a death-rate of 13·64 per cent.*

The prognosis is gravest in cases occurring during pregnancy, less grave in those occurring during labour, and least grave in those occurring during the puerperium. The earlier in pregnancy the onset is, the graver is the condition, and the same is true regarding labour. In the eighty cases the prognosis was much more favourable among the multiparæ than among the primiparæ. This is the reverse of what has usually been found. It agrees, however, with my whole experience. Roughly speaking, the more numerous the fits, the graver is the outlook, but occasionally one sees cases which die after one or two fits. Such cases are usually profoundly comatose, and have almost, if not complete, suppression of urine. If the fits are frequent and severe, and the coma deep, the outlook is exceedingly grave. As regards the urine, the principal factor influencing the prognosis is undoubtedly the quantity excreted. If this is small, and does not increase very quickly after delivery, the prognosis will be very grave. The quantity of albumin present will not influence the prognosis much. A patient with a small quantity of albumin in her urine may have a very severe attack. When there is much blood present the prognosis is grave, but not necessarily hopeless (see Case XVII.). An exceedingly quick pulse is a bad indication if it does not soon incline to slow down. In most of my cases the temperature has been raised for a few days, but not markedly so in the fatal ones.

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* During the last eighteen months all the cases I have treated (fifteen) have recovered.

As regards the child, the prognosis is very bad. If the seizure takes place before the child has reached a viable age, it is very likely to be sacrificed by emptying the uterus. My experience leads me not to interfere with the uterus unless the fits recur in spite of treatment. After ten fits, the chances for the child are exceedingly small. If it is born alive, it may die of convulsions or of general debility. Probably not more than 40 per cent. of the children ultimately survive.

Treatment.—The following method of treatment is the one I have been practising for several years, both in my hospital and private work. I have tried all the other usual methods, and, from a wide experience, I have no hesitation in saying that the saline infusion method has given much better results than any of the others. In the Maternity Hospital the death-rate from eclampsia has been reduced nearly 50 per cent., taking the cases just as they come.

The method is based upon the assumption that there is a toxic substance circulating in the blood. We do not know what the substance is, and therefore cannot administer an antidote. Our efforts must, in the meantime, be limited to freeing the system from it as quickly as possible. To give drugs to control the convulsions, which, after all, are only a symptom, seems to me somewhat irrational.

There are three main channels through which a poison may be eliminated from the blood—viz., the skin, the bowels, and the kidneys. The importance of keeping these channels open has long been recognised. If we had plenty of time there would be no difficulty in the matter. This fact has already been demonstrated in connection with albuminuria of pregnancy, and the cases there cited show that, by appropriate treatment, eclampsia can be prevented. I might cite many more cases to prove this, but it is already familiar to every obstetrician. In the majority of cases convulsions have already commenced, and we no longer have time to establish action by drugs in the usual way, so that other means must be adopted.

The best way to act upon the skin is either by hot packs or vapour baths. In using the hot pack, care must be taken to wring the blankets well, or the skin may easily be blistered. For the same reason hot-water bottles must not be allowed to touch the bare skin. The packs or baths may be repeated, but the pulse must be watched. I usually leave the patient in the bath or pack for half an hour. Pilocarpine will cause profuse diaphoresis, and it has been and is still sometimes used, but it is exceedingly depressing, and is very liable to increase any œdema of the lungs which may be present. The increase of mucus in the bronchial tubes may be so great as to cause the patient's death. I have never used this drug, and cannot recommend it.

To get the bowels to act is very difficult. Croton oil is often recommended, but even in large doses it frequently fails. I have often given 5 minims without the least effect, and in two cases I have seen œdema glottidis arise after its use. I give from 2 to 4 large tablespoonfuls of Epsom salts, introducing them through a stomach-tube, unless the patient is quite conscious. Enemata are useful to unload the lower bowel, and also to start the action of the bowels later on. Jalap is also useful; but whatever drug is given must be administered in a very large dose. Absorption is in abeyance, and the action exceedingly sluggish. If a hypodermic purgative could only be devised, it would be most useful.

The kidneys are the organs of excretion which are most at fault, and, if we can get them to act promptly and freely, all will go well. If there is time before the fits come on, diuresis may be established in the usual way by suitable drugs, given by the mouth, but in the actual fits the patient as a rule cannot swallow, and, even if we introduce drugs into the stomach, they will probably not be absorbed, and, even if absorption were normal, there is not time to wait. It is with the idea of flushing the kidneys freely that I have been giving large infusions of normal saline solution, combined with a diuretic. I first used the bicarbonate of potash along with the sodium chloride. Potash salts, when introduced directly into the blood, are said to have a most poisonous effect upon the heart, but when introduced into the cellular tissue no poisonous effect seems to be caused. I have used as much as 3 pints of infusion, with 30 grains of the bicarbonate of potash in each, without the least indication of any poisoning. The soda salts are non-poisonous, and I have therefore substituted the acetate of soda in drachm doses to the pint, as its diuretic action is weaker. I am quite convinced that the infusion causes a diuretic action, but this is difficult to prove. The infusion also acts beneficially, by diluting the poison and stimulating the system, just as the normal saline solution does when given in cases of septicæmia. The pulse rapidly improves.

The apparatus for giving the infusion is a very simple one—viz., a medium-sized trocar and cannula, as supplied in Potain's aspirator, or a hollow needle, a few feet of small tubing, and a funnel. Messrs.

Gardner, of Edinburgh, have fitted up a very convenient apparatus in a metal case (Fig. 23, p. 204). Messrs. Burroughs, Wellcome and Co. have made up, at my request, soloids of sodium chloride and sodium acetate—1 drachm in each. Boiled water should be used at about a temperature of 104° F., as it cools slightly in passing through the tube. Before use the apparatus should be sterilized by boiling.

The infusion may be given into any part of the body where there is loose cellular tissue, but under the breast, preferably the right, is the most convenient situation before delivery. After delivery, the lax abdominal wall does admirably. The skin should be well cleansed before the puncture is made. If the breast is selected, the trocar and cannula should be thrust well under the breast, and not into the mammary tissue. It has been advised to freeze the skin at the site of the puncture with chloride of ethyl, but this should not be done, as a deep slough is liable to form. If the solution does not begin to run at once when the trocar is withdrawn, the end of the cannula is against firm tissue, so it should be drawn back a little and moved about. With lax tissues a pint can be introduced in about five minutes. One pint can always be easily put under a breast, but two, or even three, may be introduced. A large tense swelling forms, and there will be considerable pain in it, but absorption quickly relieves the tension. It will be all absorbed in about an hour. The part usually remains painful for some days. If the infusion is given into the axilla, the pressure upon the brachial plexus will cause considerable numbing of the arm. The puncture should be covered with adhesive plaster or collodion. In several hundred infusions I have only once seen an abscess form, and in that case the infusion had been given by one of my residents in a frightfully dirty house, where it was impossible to carry out aseptic methods. A large abscess formed under the breast, and had to be opened. It caused very little disturbance of the temperature, and the pain was not acute. The odour of the pus suggested *Bacillus coli* as the infecting agent.

The urine excreted after an infusion is usually heavily loaded with urates, which remain suspended, and do not deposit in the usual way, even if kept for days. The large amount of albumin may account for the suspension, but I have never noticed this in the urine of cases treated without infusions. If the patient's condition does not improve in a few hours, I usually repeat the infusion. As soon as she is able to swallow, she should be given as large an amount of imperial drink and milk as she can take. When the pulse is weak, free stimulation must be resorted to.

If the patient is full-blooded, with a strong bounding pulse, the old treatment of bleeding should be tried. From 15 to 20 ounces of blood should be drawn from a vein in the arm. The saline fluid should then be run directly into the vein. This will remove a certain amount of the poison, and the transfused fluid will quickly make up the loss and dilute the remainder. I have found bleeding to act exceedingly well, and now use it frequently, even in cases without great tension in the pulse. I always transfuse at the same time. In all cases post-partum hæmorrhage ought to be encouraged, but it rarely occurs. The blood lost is always very black. In hospital work in a large city like this the patients are not often of a robust constitution, but bleeding can be resorted to in many cases provided that transfusion is also done. Two pints is the quantity I usually run into the vein.

For controlling the fits I have used most of the ordinary remedies in use—viz., chloroform, chloral, and bromide, morphia, and veratrum viride. During the last three years I have given nothing for the fits except chloroform, and occasionally a dose of chloral and bromide when there was much restlessness. Morphia I have given up entirely, after using it freely for a time. I am now quite convinced that it lessens the excretion of urine, and thus tends to counteract the effect of the infusions. In a case under the care of a colleague the pupils contracted to the size of a pin's point, and she died, with complete suppression of urine. It looked exactly like a death from morphia poisoning.

Obstetric Treatment.—Each case must, of course, be judged on its own merits, but, broadly speaking, in cases of convulsions before labour begins the less interference with the uterus the better. In a case occurring early in pregnancy, and for the second time, emptying the uterus is called for (see Case XXVIII.). In several of my cases I have relieved the patient, and she has had a perfectly natural labour some days or weeks later. If the fits cannot be controlled, the uterus should be emptied by *accouchement forcé*. The patient should be put deeply under chloroform, to avoid shock. Dilatation may be effected by Bossi's dilator or by free incision. If necessary, the incisions should be stitched after delivery. Any bleeding which occurs will be beneficial. Vaginal Cæsarian section has been advocated, but it is not a very suitable operation for general practitioners. Ordinary Cæsarian section has been advocated and practised in such cases, but the death-rate has been exceedingly high. In Case XIV. I performed this operation and removed the uterus, but this was done on account of a contracted pelvis, and not because of the convulsions. When one can deliver so quickly by dilating with Bossi's instrument or incising the cervix, I see no need for doing Cæsarian section. In cases where the os is fully dilated or quite dilatable, the patient should be delivered at once. Post-partum hæmorrhage should always be encouraged. I have only twice seen it occur to an alarming extent, and one of these cases was a twin pregnancy. The patient bled until she was almost pulseless, but she never had another fit, and made an excellent recovery (see Case IV.).

Case I.—E. M., 1-para, aged seventeen. Admitted August 31, 1897, 9.15 p.m.; delivered at 10.30. Recovered. Child, female, alive, weighed 6 pounds.

The patient was first seen at home by a nurse. A fit came on before the nurse had time to examine her.

In infancy she had had scarlet fever followed by dropsy, and when five years old she was said to have had dropsy again. For the last three or four weeks swelling of the legs had been noticed.

When the out-door surgeon saw her she was having a fit. He gave her $CHCl_3$, and had her removed at once. The os was nearly fully dilated. Half an hour later the head was almost on the perineum. She was given $CHCl_3$, and delivery effected by forceps. Post-partum bleeding was encouraged, but very little came, and what did was very dark in colour. An enema of 60 grains bromide and 30 of chloral was given. She had a seizure two hours later, and she became very restless; 2 drachms bromidia were given by the rectum. She became quieter, and dozed during the night. The bowels were freely moved. There was very little urine passed; specific gravity 1026; considerable albumin.

September 1.—She looked very dull, and could hardly be got to take any nourishment. She had three slight fits and one severe one during the afternoon. For the latter she was given $CHCl_3$. At noon 2 drachms bromidia were given by the rectum, and the same later in the afternoon. Towards evening a good deal of throat rattle was observed. She passed a fairly quiet night, but would not drink much, and the urine was very scanty. Pulse had all along been about 120, of high tension and regular.

September 2.—She was very drowsy; pulse now about 130, irregular and intermitting. The albumin was less, but there was very little urine being passed. She would drink scarcely anything.

In the evening she was very drowsy, and could scarcely be roused. The skin was very dry, and the pulse was markedly intermittent. At 9.30 p.m., 20 minims tinct. verat. virid. were given hypodermically, 20 ounces saline solution (30 grains pot. bicarb. and 60 grains sod. chloridi) injected into the areolar tissue of the left axilla, and the patient put into a hot wet pack. Before half the saline solution was injected she became perfectly conscious, and drank freely of imperial drink and milk. In an hour and a half the pulse-rate had fallen thirty beats, and in another hour ten more, and was quite soft and steady. She passed a fairly good night, and drank freely.

September 3.—She was much better. Had drunk in all 100 ounces of milk and imperial drink. The urine had increased markedly, but it could not be measured, as some was lost with the motions. Pulse 96, regular, high tension.

September 4.—In last twenty-four hours 96 ounces of urine were measured, besides what was passed with two free motions. Next day 100 ounces of urine were collected; albumin still present.

On the 7th she developed a dry pleurisy in the right side, above the liver. The friction disappeared in four days. By the 18th she was very well, but anæmic-looking.

CASE II.—Mrs. B., 1-para, aged twenty-eight, seven months pregnant. Recovered. When admitted at 5 p.m. she was in a drowsy condition, alternating with frequent periods of extreme restlessness. She had been having fits hourly since the morning. She had three shortly after admission. Her pulse was of high tension, 130 to 140. Fifteen minims tr. veratrum viridis were injected hypodermically, and within half an hour the pulse-rate fell to 110. For three hours it remained slower than this. The os was only slightly dilated. Four hours later the os was in nearly the same condition. Under $CHCl_3$ dilatation was effected by means of Hegar's dilators and the fingers, and the child was delivered with forceps. It was still-born. A pint of saline (pot. bicarb. and sod. chloridi) was injected into the right axilla immediately after delivery. The pulse was now 130, but of low tension. The urine became solid on boiling.

She remained semicomatose for forty hours after delivery. During all this time there were constant spasmodic movements of the right leg and of both eyeballs. She was freely stimulated with brandy every hour, and given a diuretic and milk. In the first and second twelve hours only 14 ounces and 15 ounces of urine were collected. Early on the morning of the second day she became collapsed. Hypodermics of strychnine and ether were given, and hot fomentations applied over the heart. At this time her pulse was 144, and very feeble. During the third twelve hours, 17 ounces of urine were collected. I again injected a pint of saline into the left axilla, with the result that during the next twelve hours she excreted 69 ounces of urine. During each consecutive twelve hours 115 ounces, 63 ounces, 60 ounces, 54 ounces, 70 ounces, and 60 ounces were collected. Over and above these amounts, a good deal was lost with the motions. The albumin quickly lessened in amount. The first three specimens of urine drawn off after injection were quite milky in appearance, from urates, which remained suspended, and did not deposit as urates usually do, although we kept the specimens for several days. This may have been due to the large amount of albumin present. In all the other cases the urine was in the same condition, but I do not remember ever noticing it in cases which were not injected.

She made a slow recovery.

Case III.—Mrs. D., 1-para, aged twenty-two, six months pregnant. Recovered. She had had headaches daily for about six weeks. Her urine had been high-coloured for two months, and scanty for the last month. During the night of May 13 her headache had become very severe, and vomiting had come on. About mid-day on the 14th she had a fit, and a second one about 2 p.m. She was brought to the hospital about 9 p.m. There was very little œdema of the legs. There were no uterine contractions, but the os admitted one finger. The fœtal heart was audible. The urine became almost solid on boiling. An enema was given, and just as it began to act she was seized with a very violent convulsion. After it passed off she was drowsy, but not unconscious. Her pulse was 130, and of very high tension. I at once gave her a hypodermic of tr. veratrum viridis (15 minims), and injected a pint of saline (pot. bicarb. and sod. chloridi) into the right axilla. The pulse-rate fell 15 beats in half an hour, and came down to 90 in a few hours. The bowels were thoroughly cleared with croton oil. She passed a fairly comfortable night, except for headache. She was given some brandy, and put on a diuretic mixture and milk. Twelve ounces of urine were collected in the first twelve hours, but a great deal was lost with the motions. It was thick and milky, and did not deposit the urates. There were some hyaline and granular casts, but no blood in it. The albumin had not diminished much.

Next day she was feeling comfortable, and passed over 60 ounces urine. During the next two days she passed 130 ounces and 210 ounces. The albumin was lessening. She kept well, and passed large quantities of urine, until the 21st, a week from the first seizure, when labour came on, and a dead child was born naturally. It had been alive until the labour came on. She had three doses of chloral to relax the cervix, and $CHCl_3$ was administered towards the end of the second stage.

During the puerperium the diuresis continued and the albumin disappeared. She made a normal recovery.

Case IV.—Single, 1-para, aged twenty-three; full time; twins. Recovered.

Her previous health had always been good. Six weeks ago her feet and ankles had become swollen, and her face puffy in the mornings. Her father was a twin.

Her pains began on the 16th, and she was seen by two students, who found the os slightly dilated. They gave her an enema, which cleared the bowels thoroughly. On the morning of the 18th two nurses saw her about 9 a.m., and found a child had been born before their arrival. Her friends stated that she had had a fit just as the child was coming into the world. The abdomen was still very large, and a second child was diagnosed. When the resident arrived he found her in a fit, so he gave her $CHCl_3$, and had her removed at once. On admission at 11 a.m. a hypodermic of morphia (½ grain) was given, and the second child delivered by forceps. The child, a male like the first, was alive. They weighed 6 pounds and 6½ pounds respectively. A large double placenta, partially attached, but with distinct sacs, was expelled, along with considerable clot, in about ten minutes. It weighed 2½ pounds. A very severe post-partum hæmorrhage came on. An intra-uterine douche of sterilized water (116°) was given, and ergotin hypodermically. The pulse became almost imperceptible. Twenty minims of ether and $\frac{1}{40}$ grain of strychnine were given hypodermically, and over 2 pints of saline solution were run into the rectum and 1½ pints into the right inframammary region. The pulse improved, but was still very rapid and weak (175). A second hypodermic of ether was given, and 2 ounces of brandy by the rectum. The foot of the bed was raised. She was given 2 drachms of brandy by the mouth every hour, and as much milk and soda as she could drink. The pulse gradually improved. Four and a half ounces of urine were drawn off in the evening. It contained blood, and was heavily loaded with albumin.

The following amounts of urine were measured during the next four days, besides what was lost with the motions—viz., 109½ ounces, 149½ ounces, 92 ounces, and 83 ounces. Her pulse remained about 120 for a considerable time.

She made a fairly good recovery.

In my clinical remarks during the delivery, I said I hoped she would bleed; but I did not count on having to cope with such an alarming hæmorrhage. In my experience of eclampsias I have only seen one other case of post-partum hæmorrhage, although many of them have been under $CHCl_3$ for a long time, and the uterus has purposely been left to relax, if it would. In this case the twin pregnancy was the cause.

CASE V.—Mrs. K., 4-para, aged thirty, eight months pregnant. Recovered.

Her former pregnancies and labours had been normal. During the present pregnancy she was quite well until a month ago, when she had an attack of influenza, which confined her to bed for two or three days. On Monday, February 27, she began to suffer from headache, and on the following day swelling of the feet, hands, and face came on, and this had since gone on increasing. On March 3, at 6.30 a.m., she was seized with convulsions. The fit lasted two or three minutes. She had a second fit half an hour later. She was seen by her doctor, who gave her ½ grain of morphia hypodermically, and drew 6 ounces of blood from the left arm. Up to the time of admission, at 11 a.m., she had no more fits. She was lying in a lethargic condition with contracted pupils. She could be roused with a little difficulty. She was a stout, plethoric woman with a ruddy complexion. There was well-marked œdema of her legs, arms, face, and trunk. The puffiness under the eyes was very marked, and the right eyeball was very prominent. We supposed this might be due to œdema of the cellular tissue of the orbit, but, as the protrusion did not lessen afterwards, there must have been some other cause. She afterwards stated that it had always been so. The ophthalmoscope revealed nothing abnormal in the eyes except œdema of the retinæ. Eight ounces of urine were drawn off. It was loaded with albumin. The uterine fundus reached half-way between the umbilicus and the xiphisternum. There were no contractions going on. The os admitted one finger. The fœtal heart-sounds were distinctly heard to the right and below the umbilicus. Twenty-four ounces of saline solution (pot. bicarb. and sod. chloridi) were injected into the right axilla. It took exactly four minutes to run it in. A dose of calomel and jalap was given, and imperial drink and milk ordered, but she could not be got to take much. At 6.30 p.m., when the catheter was being passed, she had a fit, which lasted about one minute. She was given a dose of chloral and bromide by the rectum. Only 4½ ounces of urine were obtained. It was thick and muddy, and the urates did not deposit on standing.

About 9.30 p.m. an enema was given, as the bowels had not acted.

Thirty ounces of saline fluid were then injected into the left axillary tissues, and the patient was put into a hot pack for half an hour. At 11.30 p.m. 30 grains of jalap were given and 1 drachm of bromidia. She slept fairly well, and drank in all 18 ounces of milk and imperial drink, but she only passed 5½ ounces of urine. She had perspired pretty freely after the hot pack.

In the morning she was fairly comfortable. The os was found to be dilating, but she felt no pains. About 7 p.m. she was delivered of a live female child, 3½ pounds in weight. Her labour was practically painless, and she had no threatenings of convulsions. Her puerperium was normal. The temperature never rose above 98·4°. She went home on the tenth day.

The following is Dr. Carstairs Douglas's report on the urine :

"1.—*Urine before Saline Injection.*—Deep sherry colour ; acid ; specific gravity 1020 ; albumin abundant ; creatinine plentiful ; sugar (?). It reduces Fehling's solution, but this is possibly due to the urates and creatinine. No bile ; no acetone ; indigogens normal ; urea 1 per cent. (low) ; uric acid 0·087 per cent. (higher than average of health).

"2. *Urine after Saline Injection.*—Thick, muddy, brown, due to copious deposit of urates, very abundant ; specific gravity 1032 ; acid ; albumin plentiful ; a few tube-casts and red blood cells ; no acetone ; urea 1·4 per cent. (rather low) ; uric acid 0·15 per cent. (very high, nearly double that before the saline injection). There has apparently been a great washing out of uric acid by the saline.

"3. *Urine One Day after Delivery.*—Clear, amber, and more limpid, mere trace of albumin ; urea 1·7 per cent. (nearly normal) ; uric acid 0·028 (distinctly lower than normal)."

It will thus be seen that there was a great increase in urea, and markedly so in uric acid immediately after the injection. The diuretic effect was not nearly so marked in this case as in the others, and this I believe was due to the morphia.

CASE VI.—A. W., single, 1-para, aged nineteen, seven months pregnant. Recovered. This patient was sent into the hospital with the history of having had fourteen fits. She was in a semicomatose condition, and could not be roused to speak. There was slight œdema of the feet. Her pulse was 130 and thready. The os was beginning to dilate. The urine was loaded with albumin.

At 2 a.m. 30 ounces saline were injected into the right inframammary region, and a large dose of calomel and jalap given. She was put into a hot pack, but did not sweat at all. In two hours' time the os was dilated, and I delivered with Milne-Murray's forceps. The fœtus was commencing to macerate. After delivery 24 ounces more saline were injected into the left axillary tissues.

She remained semicomatose for nearly two days. She could be roused and got to drink, but would not answer when spoken to. When she became conscious she said she had no recollection of anything since two days before the seizure. In the first twenty-four hours she passed 30 ounces urine and five motions, in the second 90 ounces and two motions, in the third 145 ounces and one motion, in the fifth 83 ounces.

Her recovery was uneventful. She had no fits after admission. The urine was free from albumin when she was dismissed on the tenth day.

The urine was examined by Dr. Carstairs Douglas, and the following is his report :

"1. *Urine before Injection.*—Opaque, light yellow, highly turbid from urates ; albumin abundant. Urea not estimated owing to smallness. Uric acid 0·101 per cent. (note uric acid is distinctly above average).

"2. *Urine shortly after Injection.*—Opaque, light yellow fluid, loaded with urates and albumin. Moderately acid. No blood, bile, or acetone. Turns Fehling's solution reddish purple, but does not reduce it. Urea 1·6 per cent. (rather low, especially as urine was probably concentrated). Uric acid 0·112 per cent. (distinctly above average ; increased since injection).

"3. *Urine Twenty-four Hours later.*—Almost clear, amber, acid ; trace of albumin. No effect on Fehling's solution. Urea 2·4 per cent. (distinct rise). Uric acid 0·0217 per cent. (marked fall below the average)."

Case VII.—Mrs. B., 2-para, aged twenty-seven, seven months pregnant. Died. She was admitted in a semicomatose condition. She had had eight fits. For a fortnight the feet and legs had been swollen, and she had vomited a great deal. A doctor had seen her and prescribed for her. There was marked œdema of the whole body, the conjunctivæ being also œdematous. There was great œdema of the lungs. She had the most œdema of any eclamptic patient I have ever seen. About 2 ounces of very bloody urine were drawn off. It became solid on boiling. Her pulse was 104, and very tense. She was not in labour.

We drew off about 6 ounces of blood from the median basilic vein, and injected 40 ounces of saline fluid (pot. bicarb. and sod. chloridi) into the axillary tissues. She was then put into a hot pack, and a dose of calomel and jalap was given. In less than an hour she had a fit. We then gave her ½ grain morphia hypodermically. In three hours she had a second fit, followed by another in twenty minutes. A ¼ grain morphia was now given. Her pulse was 118 and weak. There was no recurrence of the fits, but she vomited a great deal of a dark fluid, evidently partly digested blood. Nutrient enemata and brandy were given. She was very comatose.

Twelve hours after admission the os was beginning to dilate. I therefore dilated forcibly, sufficiently to get forceps on, and as the child was dead, we perforated the head to lessen it. The cervix was somewhat torn, but there was no hæmorrhage. What little blood came was very dark in colour, as it usually is in eclampsia. Thirty ounces of saline were run into the tissues of the abdominal wall. Only 2 or 3 ounces of urine were excreted in the twelve hours, and it was very bloody. In the evening, eight hours later, she was still deeply comatose, and as her pulse was much weaker, digitalin and strychnine were given hypodermically every alternate two hours. All attempts at moving the bowels by calomel and jalap and enemata failed, with an exception of one very slight motion. Hot poultices were applied over the kidneys.

Twenty-four hours after delivery she was still deeply comatose; her pulse was 140; breathing very bad. The œdema had lessened very much, but the kidneys were not acting. I again injected Oi. saline into the abdominal wall, and the resident opened a vein, to see if it would relieve her, but as it had no effect we only drew 4 ounces of blood. We kept on stimulating her, but she died, deeply comatose, six hours later, forty-four hours after admission.

This was an exceptionally bad case, and we had practically no hope of her from the first. In spite of all our efforts we could not get the kidneys to act. In the forty-four hours she was in the hospital they only excreted 11½ ounces. The conditions found at the post-mortem quite accounted for her death.

The Post-mortem Examination. — "The pericardium contained 6 ounces of clear fluid; the pleural cavities were also full of fluid. In both lungs there were areas of pneumonic consolidation scattered throughout, the lower lobes especially.

"The liver showed nothing abnormal to the naked eye. The spleen was slightly enlarged.

"The stomach presented an hourglass contraction, and contained about 8 ounces of dark fluid, apparently partly digested blood. She had been vomiting this fluid all the time she was in hospital. The fundus of the stomach was intensely hyperæmic, and this condition extended almost to the pyloric end. Numerous small ulcers appeared along the lesser curvature at the pyloric end, and a few larger ones near the œsophagus. Some of the ulcers had a flooring of dark blood, but none of them had red margins.

"The intestines were intensely hyperæmic in patches, especially the duodenum and upper part. There was also a patch of the same kind in the rectum. There were no ulcers.

"The kidneys were somewhat hyperæmic, but showed no marked disease.

"There was nothing abnormal in the brain

"The cervix was torn bilaterally.

"The condition of the stomach and intestines looked exactly as if an irritant poison had been administered."

Case VIII.—Mrs. H., 1-para, aged twenty-seven, seven and a half months pregnant; admitted May 11. Recovered. Patient had had two fits before admission. She was conscious, and gave the following history: Three weeks ago she had had severe headache and vomiting. Eight days ago swelling of the legs and feet had begun. All last week she had had a severe sore throat. She had not noticed any rash. There was evidence of desquamation on the forehead, hands, and feet, and we subsequently learned that two cases of scarlet fever had been removed from the stair she lives in, a few days before. She had had the fever during childhood.

On admission she was somewhat dazed, with dilated pupils. There was œdema of legs and feet. She still complained of the throat being sore. It was red and injected, and the tongue thickly coated, with red papillæ showing through the coating. She was not in labour. The fœtal heart-sounds were distinct. An ounce and a half of bloody urine were withdrawn, and on boiling it became solid.

The treatment consisted of 20 ounces saline injected into the right mammary region, a dose of calomel and jalap, and an enema which cleared the bowels. Milk and soda and imperial drink were given freely. During the first twenty-four hours she had eight motions, and the amount of urine could not be estimated. She was sweating freely. The albumin was much less. Next day she passed 46 ounces, and the next 73 ounces, and the next 126 ounces and two motions. There was merely a trace of albumin.

On May 16 the patient was removed to a private house, as we had no means of isolating her.

May 24.—She has kept very well since leaving the hospital. The bowels have been kept free with a dose of salts each morning. Her food has consisted of milk diet. The urine has not been measured, but she has been passing plenty of it. On testing it to-day, I found there was a considerable trace of albumin, so I put her on a diuretic of acetate and citrate of potash.

May 29.—Pains began on the afternoon of the 28th, and labour went [illegible] owly. At 11 a.m. on the 29th I found the os about the size of a [illegible] The bowels were thoroughly cleared by an enema, and 10 grains [illegible] al and 20 grains of bromide given every two hours. Several doses of this were given after delivery. At 4 p.m., as she was beginning to complain of headache, I gave her $CHCl_3$, dilated, and delivered with forceps a live female child which weighed 3¼ pounds. There was no post-partum hæmorrhage, but the discharge was free. There was only about an ounce of urine in the bladder. It had a considerable amount of albumin in it.

During the first eighteen hours after delivery only 12 ounces of urine were excreted, although she had been taking large doses of citrate and acetate of potash by the mouth until delivery. She was put on the diuretic again, and the urine soon increased in amount. She made an uninterrupted recovery, and her child is thriving.

Case IX.—Mrs. McG., primipara, aged twenty-three, six months pregnant. Recovered. Her legs, feet, and face had been swollen for three weeks. She had been having fits every quarter of an hour for four hours before admission, and was quite unconscious. She had three fits after admission, and was so restless that we had repeatedly to chloroform her to keep her in bed. Chloral was used hypodermically, 10 grains every hour for five hours. A pint and a half of bicarbonate of potash solution was used first, and six hours later 2 pints, with acetate of soda in place of the bicarbonate of potash. Labour had not come on, so I delivered by incising the cervix. There was very little bleeding. We had great difficulty in getting the bowels cleared. Five minims of croton oil had no effect, although followed by a large enema and 5 grains of calomel. They were ultimately cleared by a very large dose of salts.

The urine was heavily loaded with albumin, and contained numerous tube-casts, but no blood. She became conscious about twelve hours after delivery, but twelve hours later œdema glottidis set in, and her breathing became so embarrassed that tracheotomy seemed necessary, but fortunately steaming relieved her. This is the second case in which I have seen this complication. Nearly two years ago

I lost a patient from it. Its onset was so sudden that, although the resident opened the trachea as soon as he reached the patient, it was too late.

The kidneys acted after the injection, but the diuresis was not so marked as in some of the other cases. The albumin rapidly disappeared, and she made an uninterrupted recovery after the œdema glottidis subsided.

Acetate of soda was used in the second injection. I intended using it alone, but, unfortunately, had none at hand at first.

Case X.—Mrs. T., aged twenty-three, 1-para; admitted September 4 at 11 p.m. Died. This patient was unconscious. She had been having frequent fits since the morning. Swelling of her face and limbs had been noticed for two days. She was stout and well nourished. Her face was much swollen and livid; her pupils dilated, but reacting to light; her pulse rapid and tense, and her breathing slightly stertorous. The uterus was in a state of tonic contraction; the cervix thin, and the os admitted one finger. The urine was highly albuminous, showing over three-quarters on boiling.

Treatment.—Hot pack; saline injection of fully 2 pints (sodium chloride and acetate, ½ drachm of each to the pint); 10 grains chloral hydrate hypodermically, repeated twice during the next four hours; large doses of Epsom salts by the mouth and imperial drink. The bowels moved freely during the night.

September 5.—Twelve hours after admission she had a general convulsion. Under $CHCl_3$ I easily dilated the cervix and delivered by forceps. The child was slightly macerated. The saline injection was repeated (2 pints). She was passing urine unconsciously, and the bowels were moving frequently.

September 6.—Twitching of the face was followed by a general convulsion at 3 a.m. The stupor had now deepened, and the pupils would not react. The pulse was still very tense. A hot pack was applied every four hours. About 10 p.m. the coma was so profound I determined to bleed her, and we withdrew fully 20 ounces from the right median basilic vein, and ran into the vein 20 ounces of normal saline solution. Before the operation was completed the reflexes had returned, and the pupils reacted to light. The albumin in the urine was reduced to one-fourth.

September 7.—Unconscious, but not deeply comatose; pupils reacting; pulse softer; urine freely passed into bed. Gave her calomel and jalap and a saline injection of 1 pint (sodium chloride and pot. bicarb., 30 grains of each). Analysis of urine by Dr. Car-

stairs Douglas: "100 c.c. light amber-coloured, clear urine: specific gravity 1018; sugar a trace; acetone absent; blood absent; bile absent; albumin barely 1 in 1,000; urea 1·6 per cent., fair amount; uric acid 0·071 per cent. up to normal; no deposit."

September 8.—Slightly conscious; œdema rapidly disappearing.

September 9.—Increasing signs of intelligence.

September 10.—About 2 a.m. she complained of pain in the abdomen, and was slightly sick. The pain was relieved by fomentations, but the sickness recurred slightly. Her pulse became rapid and small. By 10.30 a.m. the abdomen was very much distended and tense, and she was profoundly collapsed. She was freely stimulated, but died about fourteen hours from the onset of the pain.

Twenty-four hours before her death I had given a very hopeful prognosis. The albumin had almost disappeared, and everything pointed to her speedy recovery. I could not understand this sudden abdominal complication. She had absolutely no indication of sepsis. Her temperature had never been raised. Fortunately we were able to make a post-mortem examination.

The abdomen was distended with a bile-stained fluid, in which floated masses of curdled milk. There was no blood in the fluid. We found a perforated duodenal ulcer large enough to admit the forefinger. There was no evidence of any thickening, or any attempt at adhesions; it was as clean cut as if it had been done with a punch. The stomach and duodenum were otherwise quite normal. There was very little peritoneal injection. The heart, lungs, and kidneys were normal. The uterus was normal, and well involuted.

The ulcer must have perforated at the time she complained of the abdominal pain. We had nothing to indicate what had happened. We got no history of previous pain or discomfort. It is a wonder that the strong purgatives administered had not caused perforation several days sooner.

The eclampsia had been cured. The albumin had practically disappeared. Although the patient died, I think the case can rightly be claimed as a successful one, so far as the treatment of the eclamptic condition goes. It illustrates how important it is to obtain a post-mortem examination in all fatal puerperal cases.

CASE XI.—Mrs. McL., aged twenty-nine, 7-para, about full time; admitted September 28 at 8.45 p.m. Recovered.

This patient had had symptoms of kidney disease for two years. She had dropsy after her last confinement. She had been having frequent convulsions since morning, and was unconscious, but not deeply comatose. Her face was swollen; pupils dilated, but reacting; pulse rapid, full and tense. There were signs of cardiac hypertrophy. The lungs were clear. The small amount of urine obtained by catheter was very dusky and smoky, and became almost solid on boiling. The os would admit three fingers, and the cervix was soft.

Treatment.—Epsom salts in large dose, tr. veratrum viridis (10 minims) hypodermically, saline injection of 2½ pints (acetate and chloride of sodium, 1 drachm of each to the pint), hot pack, delivery by *accouchement forcé* by bipolar version.

As the child was alive I pushed the head through by suprapubic pressure, causing a deep laceration towards the left side of the cervix. The bleeding was free, and we allowed it to go on for some time. It was easily controlled by stitches.

The veratrum viride did not reduce the pulse-rate. Diuresis began within two hours, and the bowels moved freely.

September 29.—The patient is conscious, but drowsy, passing urine freely. The albumin is reduced to one-half. There is slight hæmaturia. Epithelial and granular casts are present.

October 1.—Is quite conscious. Albumin one-quarter.

She made an uninterrupted recovery, but the albumin persisted. The cervix healed throughout by first intention.

When the child was two days old its urine contained a considerable amount of albumin, and it was loaded with urates.

Case XII.—Mrs. M., aged thirty-eight, 2-para, six months pregnant; admitted September 25 at 12.30 p.m. Recovered.

It is sixteen years since this patient had a child. She is a second wife, and, curiously enough, her predecessor died of eclampsia. Swelling of the feet had been noticed for the last two months. The convulsions had come on twelve hours before admission, and she had been unconscious from the first. The fits had been very frequent and severe—nine within the last three hours.

She was unconscious, but not deeply comatose. The pupils were dilated, but reacting, the pulse rapid and tense. There was considerable general œdema. She had a convulsion shortly after admission, while being washed. The os admitted two fingers. There was no urine in the bladder.

Treatment.—Epsom salts by the mouth, 10 minims tr. verat. viridis hypodermically, saline injection of 2½ pints (acetate and chloride of sodium, 1 drachm of each to the pint), hot packs, *accouchement forcé*. I did bipolar version, and, as the fœtus was not viable, perforated the after-coming head through the roof of the mouth. There was no bleeding. After delivery the pupils were unequal in size, but reacted to light. Pulse was much softer and slower.

Free diuresis set in within a few hours. The urine was passed unconsciously. A catheter specimen became almost solid on boiling. By evening she was beginning to be conscious. Physical examination of the lungs showed them to be extremely œdematous, especially the right one.

September 26. — Patient conscious, but cerebration slow. Pulse rapid and tense, breathing hurried, considerable cough, urine copious, albumin one-fourth.

September 27. — Pulse still rapid, slight dyspnœa, fine râles all over right lung and lower lobe of left, urine copious (albumin one-eighth), bowels kept open by salts, patient restless and slightly delirious at night.

September 28.—Flattening of percussion note all over left upper lobe, especially at back of chest.

October 10.—The pneumonia has now subsided. Her temperature was never very high. It is now normal. There is still some albumin in the urine.

Case XIII.—Mrs. R., 1-para, aged twenty-eight, full time ; admitted October 14 at 7 a.m. Recovered. This patient was brought to hospital by a doctor who had failed to deliver her with forceps after repeated efforts. She had been subject to swelling of the feet and legs during the whole pregnancy. No history of headache or convulsions.

On admission, pulse fairly good, face puffy, legs and abdominal wall very œdematous. The woman was quite conscious, but drowsy and heavy. The true conjugate we estimated at not more than 2½ inches. About 9 a.m., immediately after a vaginal examination, she took a severe general convulsion. Chloroform was given at once, and craniotomy performed. The operation was a difficult one, as we had to perforate the chest and remove the lungs before the body could be delivered. There was no post-partum hæmorrhage of any amount, and what blood came was very dark in colour. During the operation the pulse was very feeble, and could scarcely be counted.

Three pints of saline solution (sodium acetate and chloride, 1 drachm of each to the pint) were injected under the right breast, and she was put into a hot pack immediately after delivery. Two ounces of Epsom salts were given at noon, and ½ ounce every hour until the bowels moved at 6 p.m.

There was no urine in the bladder on admission. A few ounces were got by catheter four hours later. Since then she has been passing a very large amount of urine. The first specimen contained about one-fourth albumin on boiling, a trace of blood, a few pus corpuscles, and some epithelial tube-casts.

October 16.—Her temperature rose, and we found indications of pleurisy and pneumonia in the left lung.

October 18.—The albumin has rapidly decreased. There is now merely a trace, and she is progressing favourably. The uterus is involuting well.

The pleuro-pneumonia quickly resolved, and she made a good recovery.

Case XIV.—Mrs. B., aged twenty-two, 1-para, was admitted to hospital suffering from eclampsia, having had five fits in four hours before admission, and one just after admission. Died. She was at full time, and labour was just commencing. The conjugate vera was barely 3 inches. The child was alive, and lay with its head very much overlapping the symphysis. The patient was a very small, anæmic woman, with badly-deformed legs, a marked lumbar scoliosis, with the convexity to the right, and a badly-deformed chest. She was quite comatose, with a pulse running at 130. The urine became nearly solid on boiling.

Two pints of saline solution (acetate and chloride of sodium) were transfused under her right breast, and 4 tablespoonfuls of mag. sulph. introduced into her stomach through a tube.

With an ordinary-sized pelvis the condition would have been bad enough. To deliver her we had either to wait until the os was dilated and perform craniotomy, or dilate it artificially with the same object, or else deliver her by Cæsarian section. As the child was quite vigorous, I decided to do the latter, and to remove the uterus. She was prepared at once, and I operated, assisted by Dr. Gibson, within two hours of admission.

I opened the uterus in the usual way, cutting down into the placenta, which was attached to the anterior wall. The child, a male, was quite vigorous, and of full size, 7¼ pounds in weight. An elastic ligature was passed round the uterus low down to control the hæmorrhage while the broad ligaments were being tied and cut. I then incised the peritoneum of the uterus and stripped it down, and amputated through the cervix. The uterine arteries were easily secured and tied. I then stitched the cervical stump, and finally united the peritoneum over it. There was very little blood lost during the operation.

A quart of normal saline solution was put into the peritoneal cavity, and the abdominal wound closed.

The patient stood the operation wonderfully well, and soon rallied, but her pulse remained quick. She became conscious in about twenty-four hours. The albumin quickly disappeared from the urine, and for six days she did well. On the sixth day I examined the wound and found it healed. There was no abdominal distention, and everything seemed to point to a speedy recovery, but on the seventh day her breathing became rapid, and she complained of pain in her chest, and there was evidence of œdema in both lungs, and some dulness in the right. There was no abdominal pain or distention. Her pulse rose to 140, and the temperature, which had been normal, rose to 101°. The lung condition rapidly grew worse, and, in spite of free stimulation, she gradually sank and died on the eighth day. We did not obtain a post-mortem examination, but there was no evidence of sepsis in the case.

The ultimate result was exceedingly disappointing, but, so far as the eclampsia was concerned, it had been cured.

Case XV.—Mrs. M., 10-para, aged thirty-six, was admitted to the hospital from the outdoor department, on account of post-partum convulsions. Recovered. The fits had commenced shortly after delivery, and had been recurring very rapidly. The friends of the patient had at first refused to allow her removal to hospital, so the outdoor resident had infused 2 pints (acetate and chloride of sodium) under the right breast. She was shortly afterwards brought in. She was unconscious, and the urine was heavily loaded with albumin. Four ounces of mag. sulph. were introduced into the stomach, 15 ounces of blood drawn from the median basilic vein, and 2 pints of saline infused into the abdominal wall. She regained consciousness nine hours later, and made a good recovery, except that an abscess formed under her right breast, and had to be opened on the tenth day. She was in a very dirty house, and it was impossible to carry out strict aseptic methods in giving the infusion. She had no fits after admission.

Case XVI.—L. H., single, 1-para, aged twenty-six, about seven and a half months pregnant. Recovered.

The patient was admitted with œdema of feet and legs; cyanosis, but no audible cardiac murmur. The urine was heavily loaded with albumin, and there were some hyaline casts present. She was freely purged and put on a diuretic. On the second night she took a severe fit. As her pulse was full and of high tension, 15 ounces of blood were drawn from the right median basilic vein, 2 pints saline (acetate and chloride of sodium) infused, and 5 ounces mag. sulph. introduced into the stomach. The unconsciousness soon passed off, and she had no more fits. Next day labour came on, and she was delivered of a dead child. The fœtal heart had never been audible during residence. She had no more fits. The albumin lessened in amount, but did not entirely disappear, and the casts remained. There was evidently nephritis in this case.

CASE XVII.—Mrs. B., 1-para, aged twenty-three, full time. Recovered.

This patient had enjoyed good health during her pregnancy, but during the last few days her feet, legs, and face had become swollen. She had not slept well for several nights. When I saw her first, some hours after the onset of labour, she was complaining of severe headache. There was marked œdema of the face, legs, and feet, and the urine was heavily loaded with blood. It became almost solid on boiling. As the os was dilated, I gave her chloroform, and delivered with forceps. The child was dead. After the patient came out of the anæsthetic she said her headache was relieved.

She was given a large dose of salts, imperial drink, and chloral and bromide, and put on milk diet. Twelve hours after delivery she had a slight fit, and, two hours later, two very severe ones in rapid succession. I gave her chloroform, and infused 1½ pints of saline under her right breast, using 3 drachms of acetate of soda alone. A hot pack was applied, and as soon as she could swallow another dose of salts was given. Three hours later she had two more fits, when 15 minims tr. verat. viridis were given, and 10 minims more an hour later. The veratrum had no appreciable effect upon the pulse. The hot pack was repeated. The bowels soon began to move freely. Her pulse was very weak, so free stimulation with whisky was resorted to. In the evening her temperature was 103° F. She was excreting large quantities of urine, but it was heavily loaded with blood, which did not disappear from it until the fourth day, and she did not regain full consciousness until then. During this time her temperature ranged between 101° F. and 103° F., and after that it fell to normal. She made a good recovery, and has since had two children. I examined her urine frequently throughout the second pregnancy, but never found a trace of albumin in it.

CASE XVIII.—Mrs. D., 1-para, aged eighteen, full time. Recovered.

This case was delivered by students of a healthy child on the afternoon of August 20. They did not notice anything abnormal in her condition. One hour after delivery she had a fit lasting one minute, and before she could be removed to hospital she had two more.

At five years of age she had scarlet fever, but her health had been otherwise excellent. During the pregnancy her health was good. At the sixth month there was slight swelling of the feet. The day before delivery she complained of headache and was very sick, with vomiting. She had no loss of vision.

Condition on Admission.—She seemed quite unconscious, and struggled violently, and resisted anyone who tried to move her. The pupils were equal, and moderately contracted. There was no swelling of any part of the body. Eighteen ounces of urine were taken by catheter. It contained a small amount of albumin.

Shortly after admission she had a general epileptiform seizure, with rotation of the head and conjugate deviation of the eyes to the right. Fits recurred at intervals up to 3 a.m., and by this time she had seventeen in all. She now passed almost into the state of *status epilepticus* so that chloroform had to be administered for about one hour, after which the fits ceased.

Treatment.—On admission she was given 4 ounces of sulphate of magnesia by the stomach - tube, and a saline infusion of 2 pints (1 drachm each of acetate and chloride of sodium to the pint) into the abdominal wall. The latter was repeated two hours later. A hot pack was applied twice. She was given 20 grains of chloral and 40 grains of bromide by the stomach-tube. This was repeated some hours later.

August 21.—She has had no more fits, and has slept very well, but is very restless and only semiconscious. The bowels have moved eight times, and she has passed urine into the bed freely.

August 22.—She is still unconscious and very restless. Early this morning she became wildly excited, and could only be kept in bed with great difficulty. She was given another dose of sulphate of magnesia, and 20 grains of chloral and 40 grains of bromide by the stomach-tube. After this she became quiet, and soon fell asleep. Her urine is dark in colour, and with a very heavy deposit of urates. There is only a trace of albumin present.

August 23.—She is not nearly so restless, and appears to be a little more rational. Face slightly jaundiced, and the urine contains a trace of bile. The motions are clay-coloured.

August 24.—To-day she seemed quite right, and answered questions, but was drowsy and disinclined to talk. She asked to see her baby for the first time. The jaundice is quite distinct, and there is a good deal of bile in the urine.

August 26.—She continues to improve. The jaundice is less. The urine still contains bile and a trace of albumin. A few casts have been seen in the deposit to-day. The patient cannot remember anything about her labour, or subsequent to it, until she became conscious on the 24th.

August 30.—There is now no albumin in the urine, and only the faintest trace of bile. The jaundice has disappeared.

August 31.—The patient was discharged to-day feeling quite well.

This was the worst case of post-partum eclampsia I have had to deal with. There was not very much albumin in the urine, and her kidneys were evidently acting freely enough, as there were 18 ounces of urine in the bladder within three hours after delivery. Her liver was evidently involved, and that probably accounts for the severity of the attack. In Case XXI., where there was a second attack of coma, there was much more bile in the urine, but she did not show so much jaundice superficially. The fatal case, from which the frontispiece was taken, did not show much jaundice superficially, but there was too little time for it to manifest itself before death.

Case XIX.—Mrs. B., aged twenty, 2-para, sixth month; admitted January 12 at 11.45 p.m. Recovered.

For two days previous she had had a violent headache and some sickness. Convulsions had come on in the evening, and she had had six fits by the time of admission.

Her face was puffy, but there was no marked œdema. She was semicomatose. A catheter specimen of her urine became quite solid on boiling. The os admitted one finger.

The treatment adopted was a large dose of salts, 10 grains of chloral hydrate hypodermically, 2 pints of saline infusion, and a hot pack. As the fits continued, I cleared the uterus by *accouchement forcé*. The hot pack and chloral were repeated. Free diuresis was quickly established, and the bowels acted well.

The fits continued until the evening of the 13th—that is, for about twenty-four hours. She had in all twenty-eight—ten before and eighteen after delivery. At noon on the 13th I gave her another 2 pints of the infusion, and 10 minims tr. veratrum viridis hypodermically. During the next two days she was very stupid, but could be roused. She was passing plenty of urine, and the bowels were acting freely. The arm into which the chloral had been injected became inflamed. Hot boracic applications soon relieved this. By the 16th she was quite conscious. The albumin had almost entirely disappeared.

Early on the morning of the 17th she became deeply comatose, and remained so the whole day. Dr. Oliphant saw her with me in consultation, and we practically gave up hopes of saving her. About 10 p.m. we fed her with meat-juice, brandy and milk through a tube, gave her 2 pints of infusion, and 10 minims tr. veratrum viridis. At 2 and 9 a.m. on the 18th she was again fed through the tube. The coma was now lessening, and by the 19th her mind was quite clear.

After that she made an uninterrupted recovery. The urine drawn off during the coma was loaded with bile-pigment, but there was very little albumin in it. She was excreting large quantities of it. I can offer no explanation of the second attack of coma, neither can I account for the large amount of bile-pigment in the urine.

Case XX.—Mrs. G., 1-para, full time, was seen by me in consultation with Dr. Gracie. The patient had been in good health throughout the pregnancy. The urine had been examined less than a fortnight previously, and had been found free from albumin. In the evening the patient had apparently been quite well, and had partaken of some cherries. A short time afterwards she was sick, and did not feel at all well. She took a dose of castor oil. In a few hours she was seized with a violent convulsion while she was in the bath-room. She fell, and struck her right shoulder on the bath. She had several fits, and when I saw her she was unconscious, very restless, and crying out loudly. Her legs were œdematous, and her urine heavily loaded with albumin. The os was beginning to dilate. We gave her a saline infusion of 2 pints of the usual solution. She was very restless, and the fits were recurring, so I dilated with a Bossi's dilator and delivered with forceps. The child was alive and did well, although it afterwards showed great œdema, especially of the head and face. There was a considerable amount of post-partum bleeding. When the patient came out of the chloroform she was fairly conscious, and was able to swallow a dose of salts and some chloral. After the delivery we were told about the fall against the bath, and on examining the right shoulder, we found there was a subglenoid dislocation. This was reduced. When we left the patient everything seemed favourable for a good recovery, but about twelve hours later I was called back to her, to find her comatose and having fits. As her pulse was full, I bled her to the extent of nearly a pint, and gave her another saline infusion of 2 pints. She was then put in a hot pack. The shoulder had again been put out, so we reduced it, and bound it very firmly to the side. There were no more fits, and although she remained more or less unconscious for nearly three days, she made a good recovery.

I found out that the woman who was with her at the delivery was not a trained nurse, and after we had left she had carefully related to the patient all that had happened. The convulsions recurred shortly afterwards.

CASE XXI.—Mrs. A., 1-para, aged twenty-one, full time, was admitted on October 3 complaining of swelling of the vulva, legs, hands, etc., severe headache, and specks dancing before her eyes, all of a fortnight's duration. She complained of pain in the genitals, and lay with her thighs wide apart. There was very great œdema of the vulva. The abdomen was also very œdematous, and when she lay on one side the œdema of that side of the abdomen increased tremendously. It was impossible to palpate the child properly, but the head seemed to have entered the brim. The fœtal heart was audible. No vaginal examination was made. The urine was scanty, highly coloured; specific gravity 1024; albumin 10½, Esbach; urea 7 grains to the ounce; no blood; no sugar.

She was put into a hot pack, given saline purges, diuretics, and milk. Next morning she was again given a pack, and in the afternoon the labia were punctured, and 8 ounces of fluid drawn from them. For the next three days she improved. The albumin steadily diminished, 4½, 1½, and ¾, Esbach, on each of the days. On October 6 labour came on, and ended naturally. The child was alive, and weighed 8½ pounds. Six hours after delivery the patient had a typical eclamptic seizure. Twelve ounces of blood were drawn from the arm, and 2 pints of the ordinary saline solution transfused, and a hot pack applied. She had no more fits, but several marked shivering attacks. She was kept under the influence of chloral for twenty-four hours. Eight days after delivery her temperature was 99·8° F., and she complained of headache. The lochia were found to be fœtid, so the uterus was well douched out, and a large septic clot removed with the aid of the fingers. As the clot was at the fundus, a flushing curette was introduced to remove the remains of it. On the second day after this her temperature shot up suddenly, and she complained of pain at the left side of the uterus. She lay with her left leg flexed. Next day a cellulitic deposit was easily felt in the left broad ligament. It was not very extensive. Stupes, morphia, and hot vaginal douches were used.

Three or four days later she complained of shooting pains in the left leg, and a phlegmasia alba dolens developed. The phlegmasia was treated by the application of belladonna and glycerine, and the leg was rolled in wool and supported on a pillow. The pain subsided, and everything seemed to be going well, when, in the second week of the phlegmasia (October 30), she was seized with terrible dyspnœa. She became blue about the mouth and intensely cold, but the air-hunger was the most marked feature. This lasted for some hours, when she rallied a little. She complained of great pain in the chest with the onset of the attack. The hurried breathing continued. She had several other attacks, but none so severe as the first. During one of these she complained of pain in the shoulder and liver.

A couple of days after the first attack her temperature shot up to 105° F., and then tubular breathing and crepitations could be made out over an area of about 2 square inches in the left lung. We dared not risk moving her to examine the back of the lung. The lung gradually cleared up. By this time (November 4) the right leg was swollen, but not to the same extent as the left one. The labia again became swollen, and had to be punctured. When the swelling began to subside the legs became extremely itchy, and she got into a nervous condition. She asserted the legs were continually jerking.

The patient was kept absolutely at rest, and the utmost precautions were taken to prevent dislodgment of the clot, but, in spite of this, clots must have been detached more than once.

During the severe attack of dyspnœa as much stimulant was administered as the patient could be got to take.

The albumin had disappeared from her urine before the attack of cellulitis, but as soon as the temperature rose it again appeared to a considerable amount. By November 29 the urine was again free from it.

The patient's recovery was slow. At one time the outlook seemed exceedingly hopeless.

The following five cases occurred within sixteen days in January, 1903:

Case XXII.—Mrs. B., 8-para, aged forty-two; admitted January 3 at 7.35 a.m.; delivered at 9.10 p.m. Recovered. This patient was at or near full time. Her previous labours had been normal. There was no history of Bright's disease. A week ago some swelling of the feet and legs had been noticed, and for the last few days she had complained of epigastric pain. On January 2 she had complained of severe headache and giddiness. On the morning of the 3rd, the day of admission, she was sick and vomited, and had dimness of vision.

She kept her bed, and became very drowsy and difficult to rouse. At 4 p.m. she had a fit lasting three or four minutes. From then until admission at 7.35 p.m. she had four seizures. She did not regain consciousness after the first fit, and the breathing continued stertorous.

Immediately after admission she had a typical eclamptic fit. The eyelids of the right side began to twitch first, and at the same time the pupils dilated, and double internal squint became apparent. In about thirty seconds the head was drawn from side to side rapidly, and the jaws were firmly clenched. Almost synchronously with the head movement the hands and arms were flexed, and clonic spasms began in the arms, the hands being tonically closed with the thumb inside the fingers. The legs were straight out all the time, and there were no clonic contractions of them. The breathing became very stertorous after the fit passed off. Immediately after the fit the pulse was almost 160, and nearly imperceptible. The patient was a very stout woman, but there was not much œdema. No uterine contractions could be felt. The os easily admitted two fingers, and the head presented. The urine (6 ounces) was withdrawn by catheter, and was almost solid on boiling, and contained a small quantity of blood. The patient was put under chloroform, and 2 pints of saline solution (1 drachm each of acetate and chloride of sodium to the pint) were infused under the right breast, and a very large dose of magnesium sulphate given through a stomach-tube. As the os was found to be easily dilated by the hand, this was done, while a very hot douche was administered. There was a considerable amount of hydramnios. The delivery, with axis-traction forceps, was very difficult, and the head was badly crushed. The child weighed 10¼ pounds, and its head was very large. The occipito-frontal diameter measured 5¼ inches, the suboccipito-bregmatic 4¾ inches, the biparietal 4¼ inches, and the bitemporal 3⅞ inches. The cervix was somewhat lacerated, but although bleeding was encouraged, it was not excessive. Half an hour after delivery a hot pack was given. Her pulse was 150.

During the night she had four fits, and was unconscious and very restless. At 3 a.m. she was given an enema and another hot pack, and was put on 2 drachms of brandy every two hours, as her pulse was rather weak. The bowels moved loosely, and she passed a fair amount of urine in bed. Next day she could be easily roused, but was not quite conscious. On the evening of the 5th she became quite conscious. On the 6th the albumin showed 1 per 1,000, Esbach, and on the 7th ½ per 1,000.

From that time onwards she did well, but was very weak and melancholy for some days. On the 8th she had a discharge of blood from the uterus, and that evening a slight purpuric rash was noticed over her left scapula, 8 inches by 4 inches in size. Next day there was also a slight rash in the left arm, near where a hypodermic of strychnine had been given. These rashes quickly faded. She was dismissed on the 17th. There was still a faint haze of albumin in the urine. Her depression of spirits had quite disappeared, and she was taking her food well. Her temperature was 100° F. the first evening, but remained normal afterwards. On the 6th Dr. Ernest Thomson made an ophthalmoscopic examination of her eyes, but found nothing abnormal in the fundus.

CASE XXIII. — Mrs. G., 1-para, aged twenty-four; admitted January 3 at 10 p.m.; delivered at 10.40 p.m. Died January 8. This patient was sent in by Dr. Riddell, who had found her semiconscious, cyanosed, and with foam at her mouth. There was a history of two fits previous to his visit. She had a fit an hour later while he was present, and another in the ambulance waggon.

On admission she was semiconscious, pupils widely dilated and reacting sluggishly. The pulse was 130, and not of high tension. There was no œdema. The urine was distinctly bloody, and loaded with albumin. The uterus was well retracted, and the head in the pelvic cavity. The pains were strong. As the os was fully dilated, she was delivered with forceps under chloroform. The child, a female, was alive, and weighed 6½ pounds. Three-quarters of an hour after delivery the patient had a fit, which lasted three minutes. At 12.30 a.m. (4th) 2 pints of saline were infused into the abdominal wall, and a dose of salts was given. Between then and 9 a.m. she had in all fifteen fits of varying intensity. She vomited several times, and was very restless, but still unconscious. At 2.30 a.m. 2 drachms of brandy were given every two hours, and she was put into a hot pack and an enema administered. By 10.30 a.m. only 7½ ounces of urine had been withdrawn by catheter, but she had probably passed some with the motions. She was again given 2 pints of saline, and mustard-leaves were applied over the renal regions. An hour later she was dry-cupped and poulticed over the loins, and given 1 drachm sp. æth. nitrosi, and, as her pulse was very feeble, a hypodermic of $\frac{1}{30}$ grain strychnine and $\frac{1}{50}$ grain digitalin was given. At 3 p.m. 18 ounces of urine were got by catheter. At 5.30 p.m. 2 pints of saline were again infused.

January 5.—There have been no more fits. Two pints of urine have been obtained, but as the bowels have moved seven times, a great deal more must have been excreted. The patient can easily be roused, but is not quite conscious. In the evening her temperature rose to 103·8° F., and pulse to 140, and she began to complain of pain in her left side. Physical signs of lobar pneumonia were found to be present.

January 6.—Patient was somewhat improved in the morning, but in the evening she was distinctly weaker, and her pulse became very rapid and irregular. The dulness had extended higher and become absolute. The albumin showed 3 per 1,000, Esbach.

January 7.—The albumin has decreased to about ¼ per 1,000, and she is quite conscious and clear in her intellect, but her temperature remains nearly 104° F., and the pulse irregular and weak, in spite of very free stimulation. No further examination of the chest was made, as she was so weak.

January 8.—The patient died this morning at 7.30 a.m.

The post-mortem examination, done by Dr. Carstairs Douglas, revealed pericarditis and double pneumonia. "The pericardial sac contained a considerable amount of straw-coloured fluid. The heart was small, the right ventricle very thin, dilated, and fatty, the left small and hypertrophied. The auricles were normal. The tricuspid valve-ring was much dilated, and the valve incompetent. The right lung was partly adherent from an old pleurisy, and showed marked consolidation of the middle and upper lobe. The left one was also adherent, and showed distinct engorgement with actual consolidation. The liver, spleen, and pancreas were apparently healthy, and the intestinal canal throughout appeared normal. The left kidney was congested and hyperæmic, almost hæmorrhagic. The right was little affected, save for some diminution in the cortex. The uterus was well contracted and perfectly healthy."

Case XXIV.—Mrs. L., 1-para, aged nineteen ; admitted January 10 at 1.20 p.m. ; delivered at 2.30 p.m. Recovered. There was no history of renal disease obtainable from the friends. The patient seemed to have had good health during her pregnancy, until about a week before. She was not quite at full time. About a week before she had complained of scantiness of her urine. On January 8 headache had come on, and in the evening pain in the stomach. She was no worse during the 9th, but in the evening swelling was noticed below the eyes. At 4 a.m. on the 10th the headache had become severe, and the swelling under the eyes much more marked. The epigastric pain had also increased, and vomiting came on. The first fit occurred about 7 a.m. She became conscious after the fit, but a second one occurred in half an hour. Seven more fits occurred at intervals of about half an hour, and another in the ambulance waggon. She was now quite unconscious. On admission, she had another fit in the reception-room. Her pulse was 120, and of very high tension. The uterine contractions were strong. The os was fully dilated, the membranes protruding almost to the vulva. There was no œdema of the legs, but some under the eyes. The membranes were ruptured, and delivery effected by forceps. The child, a male, was alive, and weighed 5½ pounds. It died a few days later. Two pints of the usual infusion were given, and 3 ounces of magnesium sulphate run into the stomach through a tube, and a hot pack administered. About 2 drachms of urine were got by catheter. It became absolutely solid on boiling. There was some blood in it. The next specimen of urine obtained was diluted with equal parts of water, and put up in the Esbach tube. The albumin stood fully 1 inch above the **U**-mark on the tube. I have never before seen as much albumin in urine. At 3.30 p.m. the patient vomited about a pint of greenish fluid, and asked to be left alone. She was able to swallow milk, and complained of severe headache. She slept for three-quarters of an hour, and awoke quite conscious, but complained of headache and thirst. She was given milk and imperial drink freely. At 5.30 p.m. 3 ounces of urine were obtained by catheter, and at 7.30, 2 ounces. Her bowels had moved very freely and loosely. Hot poultices were applied to her loins. In the evening she was cupped over the loins, poulticed, and given 2 pints more infusion. Her bowels had moved very freely three times.

January 11.—She has passed 3 pints of urine, besides what was lost during eight motions of the bowels. She has drunk 4 pints of milk and 4 pints of imperial drink. To-day the undiluted urine gave only ½ per 1,000, Esbach. This tremendous diminution occurred within twenty-four hours. There is a distinct trace of albumin in the child's urine.

The patient's recovery was uninterrupted. She was dismissed on the 22nd. There was still a faint trace of albumin in the urine.

CASE XXV.—Mrs. F., 13-para, aged forty; admitted January 11 at 2.30 p.m. Recovered. This patient had been delivered by forceps at home on January 9 by one of the district accoucheurs. The cord was prolapsed, and the child dead. All her former labours had been normal, but she had been troubled with swollen feet in all her pregnancies. For some days prior to this delivery her legs had been swollen, but nothing is known as to the quantity of urine passed.

On the morning of the 10th she complained of frontal headache and pain in the epigastrium, and at noon, thirteen hours after delivery, she had a fit, followed almost immediately by a second one. About two and a half hours later she was seen by Dr. Jubb, the outdoor resident. He found her quite conscious, and able to answer questions. She complained of severe frontal headache and blindness. She could discern a light used to test the pupil reflexes, but could not distinguish objects. She could not remember anything about her previous pregnancies, or about the birth of the previous day. The pupils were dilated and equal, and readily responded to light. There appeared to be slight internal squint of the left eye. Hearing and feeling were evidently normal, but intelligence rather dulled. The face was puffy, especially under the eyes, and there was moderate œdema of the legs, much more marked on the dorsa of the feet. The pulse was 96, and of high tension. The patient refused to come into hospital. She was given 60 grains jalap, and, an hour later, 30 grains of bromide and 15 grains of chloral. At 11 p.m. she was stated to have passed urine freely. A specimen was obtained. The albumin showed 3½ per 1,000, Esbach. There was a copious amount of blood, and granular and blood casts. At 11.10 p.m. the patient had a severe fit, which lasted for about four minutes.

January 11.—Patient was admitted to-day at 2.30 p.m. She was unconscious. The pupils were slightly contracted, and hardly reacted to light. The pulse was 130, and hard, and the temperature 100° F. There was slight general œdema, more marked in the face and legs. Two pints of the usual saline infusion were given, 3 ounces of magnesium sulphate, and a hot pack. The temperature fell in the evening, the bowels moved freely, and the kidneys acted well. She took milk and imperial drink freely.

January 12.—She is semiconscious, and can distinguish that there are people in the room, and can make out a white object before the eyes. Two days later her vision was quite clear. She steadily improved, and was discharged well on the 20th. There was still ¼ per 1,000 albumin in her urine. Dr. Thomson examined her eyes, and reported them to be normal.

CASE XXVI. — Mrs. C., 1-para, aged twenty-two; admitted January 20 at 2.30 p.m.; delivered January 23. Recovered. This patient had scarlet fever when a young girl, but there was no history of dropsy. She seems to have been quite healthy until some months pregnant. About mid-term she had some swelling of the face and legs, but this improved without treatment, and she continued in good health until four weeks ago, when there was a return of the swelling.

There was headache, but no other premonitory symptoms of eclampsia at this time. Three weeks ago she began to have a good deal of abdominal pain, and the eyelids became very puffy. Her eyesight was affected, there being often "a mist before the eyes."

On January 17 she complained of pretty severe and almost constant epigastric pain. There was headache and dimness of vision. Early next morning (18th) patient had a severe attack of vomiting, and this relieved the epigastric pain for a time, but it recurred more severely later in the day. As the patient was alone in her house, it is not known when her first fit occurred; but at 7 a.m. on the 19th, when her husband came home from his night-work, he found her lying unconscious on the floor. She was put to bed, and lay unconscious until 11 a.m., when she had a fit. About an hour later she became slightly conscious, and remained so until about 3 p.m., when she had two very severe fits. She did not regain consciousness after this, and between 6.30 and 7.30 p.m. she had a rapid succession of severe fits. During the day she passed urine in bed several times, but her bowels did not move. She was seen by Dr. Scott, of Tollcross, who administered chloroform to her about 11 p.m., and repeated it an hour later. She had no more fits during the night. On admission to the hospital at 2.30 p.m. on the 20th she was unconscious, but, on examining her, she partly wakened, and cried out, "Stop it." Her pupils were somewhat contracted, and responded to light. The face was flushed, and the lips and eyelids swollen. The temperature was 101° F., and the pulse 110, of high tension, and regular. The cardiac sounds were healthy and the lungs clear. There was slight œdema of the legs, but the face was distinctly puffy. The uterus reached midway between the umbilicus and xiphisternum, and contractions were present. No fœtal heart could be heard, or movements felt. The head presented L.O.A. The membranes were intact, and the os about the size of a four-shilling piece. The urine, by catheter, was of a dirty muddy colour, with a very copious deposit of urates. Diluted with equal parts of water, the albumin reached the U-mark on Esbach's tube. Granular and epithelial casts and red blood corpuscles were seen. Two pints of the usual saline infusion were given, and 4 ounces of magnesium sulphate by the stomach-tube, and a hot pack administered.

Before midnight 16 ounces of urine were passed, and her bowels had moved loosely four times. The temperature was 100° F., and the pulse 112. She took a large amount of milk and imperial drink. She was very restless.

January 21.—Patient will answer questions, though not very well. She passed 2 pints of urine during the night, and the bowels moved six times. Albumin (urine diluted half and half) gives 2 per 1,000, Esbach.

January 22.—The patient is quite sensible, but her memory is not clear. She knows nothing about her fits. She has slept well, and has no pain. She has passed about 4 pints of urine, and had five loose motions. About 8 p.m. labour came on, and ended naturally at 3 a.m. on the 23rd by the expulsion of a seven-months macerated fœtus. The fœtus had evidently been dead for some time. The placenta was apoplectic, and showed evidence of fatty changes in small areas. She slept a long time after delivery. She passed about 5½ pints of urine, and the bowels moved freely three times. From that time her progress was very satisfactory. The breasts were engorged and painful for a few days. She was dismissed well on February 3. The albumin still showed ¼ per 1,000, Esbach.

Dr. Ernest Thomson's report concerning her eyes was that the right fundus was normal; but in the left, just outside and above the macular region, there was a perfectly round thin hæmorrhage about the size of a split-pea. No other changes were seen.

CASE XXVII.—*Recurrent Eclampsia.*—First attack.

I saw this case in consultation with Dr. James Adam, of Hamilton, to whom I am indebted for the following notes:

Mrs. F., 5-para, aged thirty-eight, pregnant about seventh month. The patient had not felt very well during this pregnancy. The fœtal movements had grown weaker during the last few days. Two days before Dr. Adam saw her she had taken rather a long walk, and felt ill next day. Labour came on during the succeeding night, and a premature dead female child was born before Dr. Adam reached the house. About four and a half hours after delivery she took a convulsion, a second one in an hour and a half, and a third one half an hour later. There was marked amaurosis; she could perceive light, but could not distinguish objects or persons. She had severe headache, and a feeling of faintness and sinking. There was a tendency to diarrhœa, pronounced œdema of eyelids and face, and the urine was loaded with albumin. A hot mustard pack was given at once, then the patient was rubbed dry and surrounded with hot bottles. This produced free perspiration. A saline purge was given and a bromide mixture. There were no more fits. The amaurosis disappeared a few hours after the fits ceased, and the patient made a good recovery. There was some thrombosis of the left saphenous vein. The albumin had almost disappeared in a week, and was quite gone in a month, but a slight trace was again found a couple of months later.

Case XXVIII.—Second attack. Recovered.

The patient was now forty-three, five and a half months gone in her sixth pregnancy. After her last confinement Dr. Adam advised her to take much more fluid, as he found that she had been taking hardly any fluids with her food. When she became pregnant this time her urine was examined at regular intervals, and found free from albumin, until about a month ago, when a haze appeared and persisted, becoming slightly more distinct, but never more than "a cloud," on boiling. During three nights she had been breathless, and then she had a convulsion at 8 a.m., when Dr. Adam saw her. She had noticed swelling of the face and limbs that morning before the fit. There were no labour pains. The fœtal movements had been weak for the previous fortnight. She was put on milk and barley water, and given a diuretic mixture and 1 ounce of mag. sulph. She had three more fits within twenty-four hours. Dr. Adam decided to induce labour, and under chloroform tried to dilate the cervix with Hegar's dilators, but could only get it dilated sufficiently to introduce one finger. There was extreme rigidity at the internal os.

I saw the patient with him twelve hours later. She had had a fourth fit, a very severe one, about four hours before this, and several hours after the attempt to induce labour. After her fourth fit she was given ½ pint of saline solution subcutaneously, and 10 minims tr. verat. viridis. I gave her 2 pints of saline (acetate and chloride of sodium) into the abdominal wall, and forcibly dilated the cervix and cleared the uterus. The fœtus was alive. The cervix was exceedingly rigid, and required considerable force to dilate it.

The patient made a good recovery, but a small abscess formed at the seat of puncture.

The following is Dr. Carstairs Douglas's report of the urine:

"Colour amber, clear; odour normal; specific gravity 1022; reaction distinctly acid; deposit mucous cloud; albumin present, but not abundant = 0·75 per 1,000, Esbach; sugar, blood, bile, pus, acetone, absent; urea 1·2 per cent. (rather low); microscope practically negative."

The small amount of albumin in the second attack was somewhat remarkable. I imagine there was chronic renal mischief present; at all events, there was renal insufficiency.

Case XXIX.—First attack. Mrs. A., 4-para, aged thirty years, was admitted to the Glasgow Maternity Hospital on April 23, 1900. She was supposed to be eight months pregnant. Her three previous pregnancies had ended in miscarriages at the fifth and sixth months. In the course of the present pregnancy, up till April 23, nothing had been noticed amiss, nor during her previous pregnancies had there been any untoward symptom of note. The day before admission she had walked three miles, and had felt quite well. At 3 a.m. on April 23 her husband awoke and found his wife lying unconscious on the floor. She regained consciousness, and about 6 a.m. there was another fit, followed by a third a little later. At 9 a.m. the patient seemed to faint without any convulsive seizure, and since that time consciousness had not returned. She was admitted at 11 a.m.

After admission there was another slight fit at noon, and the patient remained comatose. There was œdema of the feet and hands, but not very marked. The urine was loaded with albumin.

Treatment.—A large dose of Epsom salts was given, and 2 pints of saline solution were infused (1 drachm each of sodium chloride and acetate to the pint). The bowels moved four times, and 34 ounces of urine were got by catheter.

Next day the coma was beginning to pass off, and on the 26th she was conscious, but her vision was dim. Early on the 27th labour came on, and at 9.15 a.m. a male child was born dead by natural efforts. It weighed 4¾ pounds.

The albumin had diminished about half before delivery, and the day after there was very little more than a trace. The patient made a good recovery, but there was still a trace of albumin in the urine when she was dismissed.

Case XXX.—Second attack. Recovered. On December 3, 1903, the patient was again admitted to the hospital in a semicomatose state, and with a history of convulsions for twelve hours.

On November 30 swelling of the legs had first been noticed. This had not been marked, and there had been no swelling elsewhere. At 11 p.m. on December 2 the membranes had ruptured, and after this she had begun to feel pains. At 4.35 a.m. on December 3 she had the first convulsion, followed by others at 5.45 a.m. and 12.45 p.m. In the intervals she had been conscious, and had complained of severe frontal headache, and had vomited frequently. At 1.40 p.m. a fourth fit had occurred, after which she had not gained consciousness. She was admitted at 2.30 p.m.

Condition on Admission.—The patient was of good colour, and well nourished. There was slight swelling of the right cheeks, but no œdema of the eyelids. The pupils were dilated, equal and fixed. She was semicomatose, and resisted any attempt at examination. Her pulse was 128, regular, and of increased tension. The respiration was noisy, but regular. There was slight swelling of the feet and legs. The fundus uteri was about 3 inches below the ensiform cartilage. The fœtal heart-sounds were audible. The os was dilated to admit one finger, and the head presented. The urine contained a very large quantity of albumin, and the microscope revealed numerous granular and hyaline casts, and degenerated blood-cells. The heart-sounds were pure, but there was distinct accentuation of the second aortic sound.

At 3 p.m. the patient had a fit, lasting about one minute. She became very pale, and her pulse-rate fell to 60. Chloroform was given, and 2 pints of the usual saline fluid were injected under the right mamma. At 3.30 the os, which then admitted two fingers, was dilated with a Bossi's dilator, and a live child was delivered by forceps. An ounce and a half of mag. sulph. were given by the stomach-tube, and the patient put into a hot pack.

The patient remained unconscious for some hours, but she took no more fits. In twenty-four hours she was able to answer questions, but was somewhat confused. The bowels moved freely, and she passed large quantities of urine into the bed.

The recovery was uninterrupted. The tube-casts disappeared from the urine, but there was still a trace of albumin present when she was dismissed a fortnight later.

CHAPTER XXX

COMPLEX OR COMPLICATED LABOURS—*Continued*

Maternal Complications (*continued*)—Malformations of the Uterus—Labour in a Double Uterus—Labour in a Case of Uterus Didelphys.

MATERNAL COMPLICATIONS.

Malformations of the Uterus.—The uterus is formed from the junction and blending of the two Müllerian ducts. In the early days of embryonal life, before the junction and blending of the ducts have occurred, the organ is a double one. If the junction occurs, but the two ducts do not blend, or if the junction does not occur at all, or only occurs in part, an abnormal uterus is the result.

Uterus Didelphys.—The two ducts have remained completely separate. There will be a double vagina also.

Uterus Bicornis Duplex.—The two ducts have joined, but have not blended. They lie united throughout side by side, but the wall of junction remains instead of disappearing. The vagina may be double.

Uterus Bicornis Unicollis.—The tubes have united and blended at the cervix, but are separated above. The vagina may be double.

Uterus Subseptus or Subpartitus.—The two tubes have united, but the blending of the two canals is not complete.

Uterus Cordiformis.—The ducts have united and blended, but at the fundus there still remains a depression, indicating the double origin.

Uterus Unicornis.—One duct alone has developed, and the other remains rudimentary.

In some cases the vagina alone may be double while the uterus is single, but a double vagina is usually associated with a double uterus.

Each half of a double uterus has its own ovary and Fallopian tube. You thus have two uteri, one or both of which may become impregnated at the same time, or within a short time of each other. If the latter happens, a mature and a premature fœtus may be born together, or two mature ones within a few weeks of each other. This I believe to be the true explanation of the condition known as *superfœtation*, which has been supposed to occur in a single uterus.

It occasionally happens that one horn of a double uterus is found to be pregnant, and yet no cervical canal leading into the pregnant side can be detected. These cases have been referred to in connection with *missed labour*. A migration of the impregnated ovum has been given as an explanation of the condition. That this can occur has been shown in cases of tubal gestation, where the corpus luteum has been found in the ovary of the opposite side ; but it seems to me that a more feasible explanation is, that there has been a narrow cervical canal present at the time of conception, and that it has subsequently become occluded. That occlusion of the cervical canal can happen in an ordinary pregnancy has been abundantly proved, and I should think it would be much more likely to occur in an abnormal than a normal uterus. When a woman with a double uterus menstruates, both sides menstruate, and, if one side is closed, the menstrual blood of that side cannot escape, unless it does so through the Fallopian tube. Of course, impregnation may occur before menstruation has been established, but this is exceedingly rare. In the cases of pregnancy of an occluded horn which have been recorded there has been menstruation, and if one horn had menstruated there is little doubt the other would have done so, and in that case the discharge must have found an exit before the ovum could have become engrafted on the mucous membrane. I therefore think that the true explanation of these cases is that the cervical canal has been sufficiently patent to allow of the entrance of the spermatozoa, and that occlusion has occurred subsequently.

Labour in a Double Uterus.—If both sides were pregnant the same difficulty might occur as sometimes arises in twin cases—viz., locking, or both presenting parts being simultaneously driven into the brim. With one side pregnant, the non-pregnant half, which is sure to be enlarged, may obstruct. The contractions of the uterus are sure to be feebler than in an ordinary case, as the walls are ill developed. It is well that this is the case, otherwise rupture would be very apt to occur. Even as it is it may occur. Malpresentations are common, and, as the uterine axis does not lie in the axis of the brim, the presenting part does not bear properly upon the cervical canal, and dilatation will be slow.

Interference is necessary in many cases. The operation to be done will, of course, depend upon the nature of the case. If delivery by the natural passages is impossible, a Cæsarian section should be done. A Porro's operation or an extirpation may be necessary, but, if possible, the uterus should be left with the tubes tied and cut, to prevent future pregnancies.

After delivery through the natural passages, severe post-partum hæmorrhage may occur, if the placenta has been attached to the septum, or the septum has been torn. In such a case firm plugging is the best treatment.

The non-pregnant horn is always lined with decidua, and this should be cleared out. It may be expelled, but one cannot trust to this. If it is retained sepsis is likely to occur.

If a vaginal septum exists and is torn during delivery, it should be completely removed, and the cut edges of the mucous membrane stitched together with a continuous suture. If it is not damaged it should be left alone.

Labour in a Case of Uterus Didelphys.—Mrs. W., aged twenty-seven, 1-para, came under my care in her own home on November 2, 1900, suffering from persistent vomiting. She had been married in February, 1900. Menstruation had begun at the age of fifteen, and her periods had been regular and painless, lasting eight or nine days. The last period had ceased on October 2. The vomiting, which had been going on for several days, was very severe. She also complained of some pain in the pelvis, but there was no vaginal discharge. On examining *per vaginam*, I found a somewhat elongated swelling lying obliquely backwards and towards the right. At first I thought it might be an extra-uterine gestation, but I could not make out any other body to represent the uterus.

My conclusion was that she was pregnant, but that the uterus was abnormal in position and shape. The examination, however, was very unsatisfactory, and I could not absolutely diagnose the condition. She was given bismuth and oxalate of cerium, which relieved the sickness for a few days, but it returned again twelve days later. She was then kept on peptonized milk, and this relieved her. On November 26 I persuaded her to go into the Maternity Hospital, as I was anxious to examine her thoroughly under chloroform. Two days later Dr. Gibson and I examined her. We found an ordinary-sized vagina with a single cervix, but a bimanual examination revealed that there was a double uterus, with one side enlarged and evidently pregnant. The enlarged half lay somewhat obliquely towards the right and back of the pelvis, while the smaller half was towards the left and front. The junction of the two parts at the cervix could be distinctly made out. It was somewhat puzzling that there was only one os to be seen. We, of course, refrained from passing a sound. Our diagnosis was that we had a double uterus to deal with, and that the right horn was pregnant.

The patient was treated for some days with rectal feeding, and the sickness abated. After that the course of the pregnancy was uneventful, except that she had occasional attacks of sickness. I did not examine her again until labour had commenced, on July 20. Abdominal palpation revealed that the uterine fundus lay towards the left side, and the head of the child was directed somewhat obliquely against the right side of the pelvis. The fundus was not so broad as it usually is. On passing my finger into the vagina I found the os admitted the tip of the finger. It was high up, and the cervical canal passed backwards and towards the right. The presenting part could not be reached, but a rounded mass, evidently the head, could be felt, with a smooth membrane over it. On making a second vaginal examination, my finger passed into a small opening, which gripped it tightly. I thought at first that it had passed into the dilated urethra, but on investigating more fully, I found that my finger was really in a small opening in the hymen, and that I had discovered a second vagina. I enlarged the opening, and then reached the cervix. The os was not dilated. I had the patient at once removed to the Maternity Hospital, where I examined her under chloroform. A careful investigation revealed that the half of the uterus connected with the patent vagina was not pregnant, but was lined with a thick decidua, which was easily removed. When the finger was in the cavity the body could be made out lying along the right side of the pregnant half for a couple of inches or so above the brim of the pelvis. It lay like a large limpet attached to the side of the pregnant half. I then fully ruptured the hymen of the second vagina, and found the os would admit the tip of the finger. The head was easily felt. The partition between the vaginæ was quite thick at the ostium, but thinner at the upper part. A careful examination failed to reveal even the minutest communication between the two canals. Dr. Gibson examined her with me, and Dr. Oliphant was also present. We decided to allow the labour to go on in the usual way.

Our former diagnosis had been correct so far, but we had thought the right half was the pregnant one. Considering that it was the side which communicated with the vagina, through which all intercourse had occurred, this is not to be wondered at. Even if we had discovered the other vagina, we would not have been likely to come to any other conclusion. The reason why we missed finding the second vagina when we examined was because it was closed by the hymen, except for a very small opening. The patent half was quite open, and the remains of the hymen very apparent. We did not make any search for a second vagina, as we did not wish to disturb the patient any more than was absolutely necessary. The abnormal position of the pregnant half was probably due to its falling towards the back of the pelvis from its own weight. Rotation of the entire uterus had apparently occurred. After delivery we found there was a tendency to the recurrence of this.

After labour had gone on for twenty-four hours very little dilatation had occurred. The contractions were fairly strong, but the obliquity of the uterus prevented the presenting part from bearing on the os. The largest Barnes' bag was inserted, and in two hours' time the os was well dilated. On removing the bag, I found it had been forced through the upper part of the vaginal septum. The obliquity of the uterus had caused this. The patient was delivered with forceps. The child, a male, was alive, and weighed 7½ pounds. The lower part of the septum was lacerated, and the perineum partially torn. The third stage of labour presented no difficulties. Both sides of the uterus were thoroughly washed out. The thick decidua had already been cleared out of the non-pregnant half. I then removed the septum, and stitched the raw surfaces on the anterior and posterior walls with continuous catgut sutures, and repaired the perineum. The puerperium was normal, the temperature never rising.

How can we explain the fact that the pregnancy occurred in the uterine half connected with the unpenetrated vagina? In the first place, I may say, I am perfectly sure that penetration had never occurred. The opening barely admitted the tip of the finger, and the fact that the hymen tore quite easily showed that it was not a resilient one, which might have stretched before a penetrating organ. That penetration of the vagina is not necessary for impregnation is a well-recognised fact. I have seen several cases of this, and one, where the hymen was intact at the time of labour, is recorded on p. 225. The spermatozoa had evidently made their way up from the vulva. Migration of the fertilized ovum might have occurred, but I think the former explanation the more probable one.

It is interesting to note that the non-pregnant half of the uterus did not menstruate.

Four months after delivery I examined her under chloroform. The perineum was found to be complete. The vaginal mucous membrane was smooth, but it was possible to trace where the septum had existed, especially at the upper part, where the remains of it could be seen. A bimanual examination revealed that there was apparently only one external os which would admit the tip of the finger. To the left the body of the horn which had been pregnant could be traced. It lay far back in the pelvis, with its fundus well towards the left side. The right horn, which was much smaller, lay towards the right of the pelvis, also backwards and outwards. It could not be so easily traced, but the junction at the cervix was easily made out. The speculum revealed that in appearance the cervix in no way differed from an ordinary multiparous one. A sound passed into the left side went outwards and backwards for 2⅜ inches. I had some difficulty in passing a smaller one into the right horn. It would only pass for about 2 inches. The handles of the sounds crossed. The septum between the two cervical canals had been slightly destroyed, giving the appearance of a single os externum.

We have thus had to deal with a double uterus (uterus didelphys) and double vagina. The vagina is now, of course, single.

I have seen two other cases of double uteri. The first patient had a badly-contracted pelvis. I delivered the child by craniotomy, using the combined instrument. To remove the placenta I had to pass my hand into the uterus, and I then found that the placenta was attached up in the left cornua of a *uterus subseptus*. The right horn would admit a portion of the hand. The fundus was very broad, but not markedly cleft. In the centre of the fundus there was a very small subperitoneal fibroid. The partition between the two sides of the uterus did not extend down very far.

The patient made a good recovery, and if she should again become pregnant, I am in hopes that she will agree to have Cæsarian section performed.

The second case was also one of a *uterus subseptus*. The breech of the fœtus occupied the right cornua, and the placenta lay in the left one. This was easily made out before delivery. The child was born by natural efforts, but the placenta had to be removed manually.

CHAPTER XXXI

COMPLEX OR COMPLICATED LABOURS—*Continued*

Maternal Complications (*continued*)—Rupture of the Vagina—Case—Rupture of the Uterus—Frequency of Occurrence—Varieties—Causes—How to Deal with the Uterus—By Suture—Drainage—Removal—Cases—Spontaneous Rupture of the Uterus—Case.

MATERNAL COMPLICATIONS.

Rupture of the Vagina.—In the majority of cases of rupture of the vagina there is rupture of the uterus as well, and the tear has extended from the cervix into the vagina. As a matter of fact, if the entire cervix is involved in the uterine tear, there is sure to be more or less tearing of the vaginal vault.

Rupture of the vagina alone may, however, happen in obstructed labours by the tension on the vaginal wall becoming so great that it gives way. This may happen in transverse presentations, or in cases of pendulous abdomen, especially in contracted pelves. It may also be caused by the hand in delivering, or by instruments being pushed through the fornix in attempts at criminal abortion. Careless use of the forceps may also cause it, as in the following case :

Mrs. W., 5-para, aged twenty-nine, was brought into hospital one night after an attempt had been made to deliver her with forceps. On examining her, I found the cervix was not quite fully dilated. In the left side of the vagina there was a rent, extending right round from about the centre behind to beyond the transverse diameter of the pelvis in front. The hand could be passed into the peritoneal cavity. The tear had been caused by the left blade of the forceps, which had been passed through the left side of the posterior fornix, and then swept round into position in the side of the pelvis. The right blade had been applied inside the cervix all right. Attempts at extraction had fortunately failed ; otherwise the left side of the cervix and a portion of the lower uterine segment would have been torn out.

The patient's condition was fairly good. As considerable traction would have been required to deliver the child, and there seemed little chance of its surviving, I perforated the head and delivered with forceps. There was no bleeding from the tear. I then cleansed the parts very thoroughly and flushed out the pelvic cavity, with the patient's body raised, and packed the wound with iodoform gauze.

The patient did well for two days, and then peritonitis set in, and she died on the third day after delivery. At the post-mortem examination we found the pelvic peritoneum was not involved, but in the upper part of the abdomen, especially about the liver, there was abundant evidence of acute peritonitis. If I had opened the abdomen and carefully cleansed out the peritoneal cavity I think she might have been saved. There was no bowel down when I examined the patient, and I was in hopes that cleansing the pelvis would be sufficient, but I afterwards learned that a loop of intestine had been down. If I ever see another similar case I shall open the abdomen and make an attempt to cleanse the peritoneal cavity.

It was difficult to get any information as to how the accident had happened, but I learned that the attendant, who had had no experience in the use of forceps, had given the patient a little chloroform, and then tried to apply the instruments. The woman had at once begun to struggle violently, and, instead of giving her enough chloroform to quieten her, he had got three women to hold her. During the struggling he had evidently forced the blade through the fornix. When he failed to deliver he called in another practitioner, who discovered the condition, and sent her into hospital.

In some cases the small intestine prolapses into the vagina, and it may be injured during delivery by tearing or bruising, or the omentum may be torn, thus interfering with the blood-supply. If the patient survives, sloughing of the bowel is apt to occur, and a fæcal fistula form. In more than one instance the prolapsed bowel has been mistaken for the cord, and it has actually been drawn down and a portion cut off.

Diagnosis of Rupture of the Vagina.—There will probably be considerable collapse and hæmorrhage, but these features may not be marked. A careful examination will reveal the rent. The less examination of the parts the better.

Prognosis.—The condition is a grave one, but much more favourable than when the uterus is ruptured. If aseptic precautions have been taken, and there is no injury to the bowel, the patient's chances are good.

Treatment.—If the child is not already delivered this must be effected in order to prevent further tearing, in whichever way puts the least strain upon the parts. If the bowel is down it should be carefully cleansed, and then returned into the abdomen above the brim, provided it has not been torn. The parts should be thoroughly cleansed after delivery and the rent plugged with iodoform gauze. If there is much bleeding, the torn vessels should be tied, but if it is general oozing, a firm plug will be sufficient. In some cases stitches might be put in, but it is better to trust to plugging, as this insures thorough drainage. If the bladder is torn an attempt should be made to close it with sutures.

If the labour has been conducted aseptically, and the intestines have not been prolapsed, there should be little risk of the peritoneal cavity becoming infected, but if you have any reason to suppose this has occurred, the abdomen should be opened at once, and an attempt made to cleanse it thoroughly by swabbing.

When the bowel has been torn an immediate resection may be done, if the patient's condition will warrant this; if not, the injured portion should be secured in the wound to allow a fistula to form. If the patient recovers, a subsequent operation will be necessary to close the fistula.

Rupture of the Uterus.—Rupture of the uterus may occur during pregnancy or labour. During pregnancy it may be the result of an accident, as a crush, or it may occur spontaneously. In the latter case the uterine wall may be diseased, or the seat of the scar of a former rupture or Cæsarian section. During labour the rupture may occur spontaneously, without any obstruction to delivery, but in most cases it arises in obstructed deliveries, either from uterine action or injudicious attempts at delivery. The use of ergot in the second stage of labour was formerly a not infrequent cause of rupture. Some midwives are still in the habit of using it, to the great risk of their patients. To judge from the frequency with which older hospital patients ask for "labour tea," its use must have been very common at one time among the poorer classes.

Frequency of Occurrence.—The average of occurrence is about 1 in 4,000 cases of labour. In 10,179 indoor cases in the Glasgow Maternity Hospital it occurred 13 times, an average of 1 in 783; but, of course, it must be borne in mind that the great majority of these cases were admitted from the outdoor department, or were sent in by private practitioners after the accident had occurred. In 41,111 outdoor cases it is said to have occurred only twice, or once in 20,000 labours, but this only means that these two cases were not transferred to the hospital, probably because they died before they could be removed. Taking the indoor and outdoor cases together—viz., 51,290, and the 15 cases of rupture—it gives 1 in 3,420, which is very near the average.

Multiparæ are much more prone to the accident than primiparæ.

Seat of Rupture.—In obstructed labours the lower uterine segment is the usual seat of rupture. It may be either transverse or vertical, or a combination of the two. It usually extends downwards, through the cervix into the vagina, or more rarely upwards, into the body of the uterus. The lower uterine segment is prone to rupture in obstructed labours, because it is the part of the uterus which thins out. The main portion of the uterus actually thickens by retraction as labour goes on, and becomes strengthened, as it were, at the expense of the lower part. Primary rupture of the body or fundus, when it does occur, is usually due to disease of the uterine wall, or to the presence of a scar of a former rupture or Cæsarian section. In such cases the rupture may occur during pregnancy, or during an ordinary labour without any obstruction. These cases are dealt with under the head of Spontaneous Rupture.

Varieties.—(1) Complete, where the tear involves the entire uterine wall right through into the peritoneal cavity. (2) Incomplete, where the mucous and muscular layers alone are involved; where the peritoneal layer alone gives way; and lastly, where the peritoneal and muscular layers are torn, but the mucous one remains intact. This latter variety is exceedingly rare.

Causes.—The usual cause is excessive thinning of the lower uterine segment. This may be due to obstruction from a contracted pelvis, a tumour blocking the passage, a transverse presentation, hydrocephalus, or some other abnormality of the fœtus, obliquity of the uterus, a rigid cervix, or impaction of the anterior lip of the cervix. In some cases compression of the uterine wall between the head and the promontory, or an exostosis of the brim, will cause it. Malignant disease of the uterine wall, or the scar of a former rupture or Cæsarian section, will predispose to it, and in some cases fatty degeneration of the muscle fibres, and especially a degeneration of, or a want of development of, elastic tissue in the wall. The administration of ergot in the second stage of labour has already been mentioned as a cause, but perhaps the most frequent cause is an injudicious attempt to deliver by version in impacted transverse cases, or after failure with forceps in vertex or face cases; or by dragging through an undiminished after-coming hydrocephalic head, or an ordinary-sized head through a rigid, partially dilated cervix, either with forceps or by traction on the body.

Symptoms.—Where it occurs from uterine action the pains usually become stronger and stronger, and at shorter intervals, until they are almost continuous, and then they suddenly cease, and the patient collapses. She may exclaim that something has given way. If you were to examine the abdomen before the rupture had occurred, you would find the uterus very hard and a sulcus running across the abdomen, usually somewhat obliquely, somewhere between the top of the symphysis pubis and the umbilicus. The part of the uterus below this would feel tense and thin, and be tender to the touch. If you were to watch the case, you would find this sulcus rise higher and higher. This is Bandl's ring, and I need hardly say nobody would be justified in watching to see it rise higher and higher in the abdomen. The appearance of Bandl's ring is a danger-signal which should never be disregarded. A distended bladder gives very much the same appearance to the eye as Bandl's ring, but to the touch the conditions are very different, as in the former condition you feel a fairly thick, somewhat fluid, mass below it, while in the latter there appears to be very little between your hand and the part of the child which is at the brim.

As soon as the pains cease there will be more or less hæmorrhage from the vagina, and the patient's pulse will show profound collapse, much more marked than the amount of hæmorrhage would indicate. If you now examine *per vaginam*, you will find that the presenting part has receded, or can easily be pushed back. If the child has escaped partially or wholly into the peritoneal cavity, you may be able to palpate two tumours through the abdominal wall. If only a partial rupture has occurred, palpation may not reveal much, but if the blood has escaped round the lower uterine segment, under the loose peritoneum, towards the front, there will be a change in the sulcus, making it much more apparent in parts.

In complete rupture the placenta may escape into the peritoneal cavity along with the fœtus, but in some cases it escapes into the vagina. In very rare instances, apart from placenta prævia, the placenta is born before the child, but when it does come first, unless the case be one of placenta prævia, you should always suspect rupture of the uterus.

In cases where rupture occurs during an attempt at delivery there is the same profound shock and hæmorrhage, and the practitioner, if he has his wits about him, ought to be able to recognise at once what has occurred.

Diagnosis.—The stoppage of the pains, the collapse, the hæmorrhage, and the recession of the presenting part plainly indicate what has occurred. Concealed accidental hæmorrhage is the only condition which will give rise to such profound shock. It, of course, does not occur during the second stage of labour, and the distention of the uterus and continuous pain in the abdomen should at once enable you to distinguish between the two.

If the rupture is complete and the child has escaped into the peritoneal cavity, palpation will generally reveal two tumours, and you will be able to make out the fœtal parts with distinctness. The presenting part may or may not have receded. If it is incomplete the presenting part will not have completely receded, and abdominal palpation will reveal that the child is still in the uterus, although the effused blood may have somewhat changed the shape of the uterus. The parts of the child will not be very easily made out, and there will not be two tumours in the abdomen. When the tear is a transverse one, low down in the anterior wall, you may not be able to make out two tumours, as the uterus will most likely lie right behind the child. The fœtal parts will be felt with great distinctness. One of the last cases admitted to the hospital was of this nature. The fœtal parts were very distinct, but no uterus could be felt. The head was still presenting, but the body of the child was entirely in the peritoneal cavity. The uterus lay right behind, and could not be palpated. The tear extended right across the lower uterine segment just at the reflection of the peritoneum on to the bladder. Both round ligaments were intact, but the tear extended beyond them. It had been caused by attempts at delivery, but we could obtain no history from the attendants as to what had been done.

Prognosis.—The condition is a very serious one, especially when the rupture is complete. The patient may die of hæmorrhage and shock in a very few minutes, or later from septic peritonitis.

Treatment.—Prophylactic treatment is of the utmost importance here. Proper treatment in obstructed labours will enable you to prevent rupture in the great majority of cases, while improper treatment will merely precipitate matters. When speaking of the various forms of obstructed labour, I have dealt with this, and shall merely recapitulate here.

In an obstructed labour, if the uterus is in a tonic state of contraction and Bandl's ring is apparent, *immediate delivery* is absolutely necessary. Chloroform should be administered at once to lessen the strain on the uterus. Put the patient deeply under. If the head is presenting and the child alive, and delivery by forceps possible, apply the instruments at once. If you fail, do not persevere very long, but perforate the head and deliver. If the child is dead, do this at once. Under no consideration attempt to do version. If the pelvis is badly contracted do a Cæsarian section as quickly as possible, removing the uterus if there is any risk of its having been infected. In a breech case deliver by traction, and if the after-coming head is hydrocephalic or too large to come through easily, perforate it. To get the body of the child down it may be necessary to perforate the abdomen. In impacted shoulder cases do not attempt to turn, but either decapitate or eviscerate and cut the spine across. At the risk of being considered tedious, I once more repeat that if you fail to deliver with forceps—*i.e.*, if the instruments hold well—never attempt to turn. Most of the cases of rupture brought to us in the hospital have been caused in this way. The case referred to on the previous page was caused, I am quite sure, in that way.

In delivering a case where rupture is threatened, the mother alone must be considered, and the method adopted which will cause the least risk to her, no matter if it means sacrificing the child. If you can save both that is a triumph, but you must not expose the mother to any extra risk in the interest of the child.

To prevent rupture from the cervix upwards into the body of the uterus, either during delivery by forceps or during the passage of an after-coming head, always make sure that the os is sufficiently dilated to allow the head to pass without tearing. Never hurry delivery where there is any risk of tearing of the cervix.

When the rupture has occurred we have to extract the child and placenta, and then deal with the uterus. The method to be adopted will depend upon the circumstances of the case. The child and placenta may be delivered through the vagina or through an abdominal incision. In an incomplete rupture, if delivery can possibly be effected through the vagina, it should be done, but, of course, if there is much obstruction, as from a contraction of the pelvis or a tumour, the abdominal route must be chosen. If the head presents, perforate it; if the shoulders, decapitate or eviscerate and sever the spine; and if it be the breech, pull it down with a blunt hook and perforate the abdomen and after-coming head if required. The child will be dead, so you need have no hesitation in mutilating it. When the child is delivered follow up the cord, and extract the placenta and any clots that may be in the uterus.

In a case of complete rupture, if the child has only been partly expelled into the abdominal cavity, and the presenting part is within reach, and there is not much obstruction, it may be delivered through the vagina in the same way. If it has completely receded into the abdominal cavity, it will be much better to open the abdomen at once and deliver as in a Cæsarian section.

How to deal with the Uterus.

In incomplete rupture, when the peritoneal layer is intact, thoroughly wash out the uterus and rent, using sterilized water or an antiseptic lotion. When the parts are as aseptic as they can be made, plug the rent and uterus with iodoform gauze. The plug may be left in for forty-eight hours, but not longer. It should then be removed, the parts douched, and a fresh plug inserted.

When the peritoneal layer alone, or it and the muscular layer are involved, there will be profuse internal hæmorrhage, and this can only be dealt with by opening the abdomen and either stitching or removing the uterus, as in a complete rupture.

In a complete rupture, if the child has been extracted through the vagina, the question comes to be whether the abdomen should be opened. If there has not been much bleeding, and the peritoneal cavity is not infected, washing out with sterilized water and then plugging with iodoform gauze, so as to prevent the bowels prolapsing, and to insure good drainage, will probably give the best results. On the other hand, if the abdominal cavity contains a large amount of clot, and the bleeding is continuing, abdominal section should be done at once. In such a case, and in those in which abdominal section has been done previous to delivery, how should the uterus be dealt with ?

1. *By Suture.*—If the tear is clean cut and in a position which can easily be reached, suturing may be done, but in most cases it is out of the question. The sutures should be put in, the same as in Cæsarian section, deep and superficial. The superficial sutures must be put in with great care, so as to bring the peritoneal edges well together to prevent any discharge from the wound getting into the peritoneal cavity. While suturing, the patient may be placed in the Trendelenburg position, as this will give a clearer view of the parts.

2. *By Drainage.*—If suturing is impracticable, the wound may be

treated by drainage, by means of a large rubber tube or a strip of iodoform gauze, the latter preferably. The end should be passed down into the vagina, but in some cases it may be better to bring it out at the lower end of the abdominal incision. The gauze may be left in for a week if the parts remain sweet. Wherever it is possible drainage should be employed, as it gives the best results.

3. *Removal of the Uterus.*—In some cases you may have to do this—as, for instance, when the rent is at the fundus, or is very extensive. An ordinary Porro's operation may be done, fastening the stump of the cervix in the lower edge of the wound, or the stump of the cervix may be covered with peritoneum and left in the pelvic floor, or you may do a complete extirpation.

In all cases, when the abdomen is opened, the peritoneal cavity should be cleansed of all clot and débris, if the patient's condition will allow of it, but if she is very much collapsed, and there has been no interference to cause septic infection, too much time should not be spent over the peritoneal toilet. Blood-clot, vernix caseosa, or liquor amnii will do no harm, provided they are aseptic. A large saline infusion should be given, and if the peritoneal cavity is closed, a quart or more of normal saline solution may be left in it. Free stimulation will be required. The subsequent treatment will be the same as after any abdominal section.

If the uterus is left, the question of sterilizing the patient is a very important one to consider. In most cases I think the tubes should be tied and cut to prevent future pregnancies, because rupture would be very likely to recur if she should again become pregnant. If a woman has once come safely through such an ordeal, she should be saved from the risks of facing it again.

CASE I.—*Incomplete Rupture caused by an Attempt to Turn in a Mento-posterior Case after Failure with Forceps.*—The patient died undelivered a few minutes after she reached the hospital. (For details, see p. 282 and Fig. 21, p. 188.)

CASE II.—Mrs. D., 8-para, aged thirty-eight. History of former labours: First and second children were born to a former husband, and the nature of the labours is unknown. The third and fourth were instrumental, children alive; fifth, born on the floor without assistance; sixth, instrumental, still-born; seventh, hæmorrhage and miscarriage; eighth, the present.

The patient had been in labour two and a half days. She was sent in by a medical man, with the history of hæmorrhage; attempted delivery by forceps, and then turning.

On admission she was collapsed-looking, lips pale, pulse feeble. There was very little external hæmorrhage; the cord was prolapsed and pulseless. On palpating the abdomen two masses could be felt with a distinct groove between.

I saw her shortly after admission, and had her put under chloroform at once. I found the diagonal conjugate measured 4 inches. There was a leg in the vagina, and the other foot was at the brim, and the placenta lay loose alongside of it. On removing the placenta, a large tear was found in the left side of the uterus, extending through the cervix and upper part of the vagina. The child's body was in the peritoneal cavity, and the body of the uterus was lying to the right side, well contracted. The breech was brought down and the body delivered. I then perforated the after-coming head, and got it away easily. The child weighed 7½ pounds.

There was no bleeding. The patient was freely stimulated.

Dr. Cameron saw her with me, and we decided to remove the uterus. The rent was so extensive that plugging seemed out of the question, and, besides, we were perfectly sure that no proper precautions had been taken to render the parts aseptic during the prolonged manipulations she had been subjected to before she was brought to hospital. In the abdomen we found a large quantity of blood-clot. The laceration extended up obliquely, the serous surface being torn almost to the level of the left Fallopian tube. Clamps were put on the broad ligaments, and the uterus amputated. The broad ligaments were then tied and the cervix extirpated. The floor of Douglas's pouch was then stitched across by interrupted sutures, but it could not be completely closed. The abdomen was cleansed and closed in the usual way.

In spite of free stimulation the patient never rallied, but died eleven hours after the operation.

In both of these cases the rupture was caused by attempts at version after failure with forceps.

Case III.—The following case occurred in the hospital, but not in my hands:

The patient was an unmarried primipara, aged twenty-eight, the subject of an irregularly contracted pelvis, with ankylosis of the left hip-joint from old-standing disease. She was supposed to be entering on her ninth month of pregnancy. Labour was induced by using first sponge tents, a bougie, and afterwards Barnes' bags. When the largest bag had been expelled the membranes ruptured. The os was fully dilated manually, and axis-traction forceps were applied. As the head did not enter the brim, Cameron's antero-posterior forceps were substituted. The head was then delivered, but found to be crushed. The uterus contracted well, and the placenta came away after some time. There was no bleeding, but the patient looked somewhat collapsed. A hot douche of carbolic (1 in 120) was given. As the fluid did not return, the nozzle was withdrawn, as it had evidently passed into the peritoneal cavity. The fluid immediately drained away, but the patient collapsed and died in a few minutes.

At the post-mortem examination a small quantity of sanguineous fluid was found in the abdominal cavity, but no blood, and the uterus was found to have a transverse rent in the lower part of the posterior wall, just opposite the promontory, about 2 inches in length (Fig. 48). The head had crushed the uterus against the promontory and caused this. The true conjugate measured 2¾ inches.

It is difficult to understand why the injection of the warm fluid into the abdominal cavity caused such a sudden collapse. It was so sudden that the carbolic could not have caused it.

I have also seen a case of partial rupture by pressure against the promontory during delivery after craniotomy. The conjugata vera was 2¾ inches. The muscular layer of the posterior wall was torn transversely just above the os internum. The tear was discovered while a douche was being given. The peritoneal cavity was not opened into. There was no bleeding. As I was sure of good drainage I did not plug. The patient made a good recovery. When she left the hospital one could detect where the tear had been by passing a finger into the uterus, but it was completely healed.

CASE IV.—*Rupture of the Uterus from Pressure of the Promontory: Hysterectomy; Recovery.*—Mrs. B., 7-para, aged thirty-two. Pelvic measurements: intercristal diameter, 9¼ inches; interspinous, 8¼ inches; external conjugate, 6 inches; true conjugate, 3½ inches. The patient was delivered by axis-traction forceps in the Walcher position. The child, which weighed 7 pounds, was alive, and did well. The placenta was delivered naturally, and an intra-uterine douche was given. The patient seemed quite well, but four hours after delivery she showed evidence of collapse. The lips were pale, and the pulse 100. The uterus was well retracted, and the discharge from the vagina was not more than normal. The abdomen was somewhat distended and tympanitic, and she complained of considerable pain. A hypodermic injection of $\frac{1}{30}$ grain of strychnine was given.

I saw the patient for the first time about ten hours after delivery, and found her very much collapsed, and with a pulse of 130. The abdomen was distended and tender to the touch. It was very tympanitic all over, and especially in the flanks. The uterus was firmly retracted. A vaginal examination revealed nothing except a somewhat boggy feeling in the posterior fornix. There was no laceration of the cervix. I did not attempt to explore the uterus. A $\frac{1}{4}$ grain morphia and $\frac{1}{60}$ grain strychnine were given hypodermically, and 1 pint of saline was infused under the right breast. The patient passed a comfortable night, and was very well in the forenoon. The pulse-rate had fallen to 100. About noon she became worse again, and the pulse quickened. Dr. Munro Kerr agreed with me that the abdomen ought to be opened. It was quite evident there was a lesion, probably of the uterus, but percussion of the flanks gave no evidence of fluid in the peritoneal cavity.

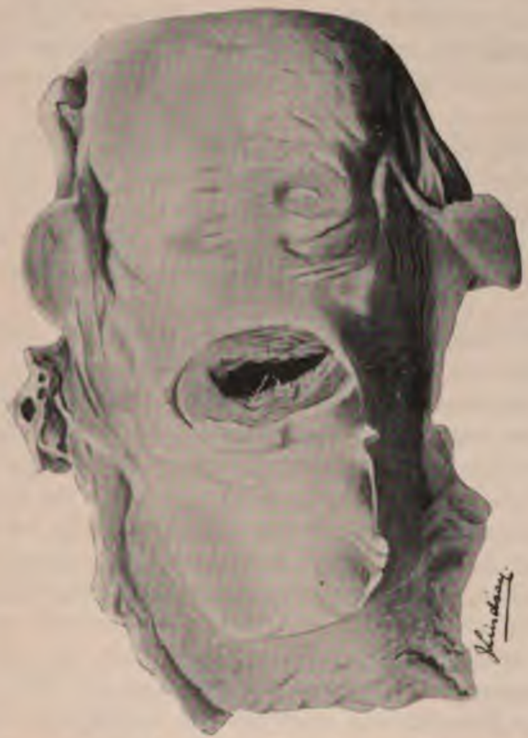

FIG. 48.—RUPTURE OF THE POSTERIOR WALL OF THE UTERUS FROM PRESSURE OF THE PROMONTORY.

With Dr. Kerr's assistance I operated twenty-eight hours after delivery. There was a considerable amount of fluid and clotted blood in the abdominal cavity. A transverse rupture, about 1¼ inches in length, was found in the posterior wall of the uterus just about the junction of the body with the cervix. The appearance was the same as is shown in Fig. 48. The uterus was amputated at the level of the rupture. The cervical stump was thoroughly cleansed, and its cavity touched with pure carbolic. It was stitched in the usual way, and the peritoneum closed over it. Most of the clot was removed from the peritoneal cavity, and 2 pints of saline were left in it. The abdominal wound was closed with through-and-through silkworm-gut sutures.

The patient stood the operation fairly well. As she had been on starvation diet for some time, rectal feeding was commenced a few hours after the operation. Vomiting was troublesome for the first day. The intestinal tract was in a very unhealthy condition, and when the bowels were moved on the third day the stench was overpowering.

On the fifth day the wound was dressed and two of the lower stitches were removed, as there were signs of stitch abscesses. Up to this time the temperature had never reached 100° F. The remaining stitches were removed a few days later. About the end of the first week the patient began to complain of a good deal of pain in the right calf and thigh, but there was no swelling. Up to the twelfth day the temperature had been fairly satisfactory, only twice reaching 101° F. On this day she took a severe rigor, and the temperature ran up to 106·4° F. The vagina was very thoroughly douched out, and the cavity of the cervical stump cleansed. The discharge was extremely foul. A vaginal douche was given daily after this, and the cavity of the stump on two occasions was swabbed out with iodine (equal parts of the liniment and tincture). In addition to that iodoform was freely used in the vagina. The temperature varied between 99° and 103° F., the maximum in the evening. On the nineteenth day there was another severe rigor, and the temperature reached 107° F., but fell to normal in a few hours. The discharge from the cervical stump was now free of odour, and very small in amount. Considerable quantities of iodoform were still being used in the vagina. The temperature continued to vary between 99° and 103° F. for the next five days. There was no septic discharge, and we could not find any secondary focus. We concluded that she was suffering from iodoform absorption, and on testing the urine, a marked iodine reaction was obtained. The patient had also lost desire for food, and there was some diarrhœa. The iodoform was stopped entirely, and the temperature gradually fell, and it lost the intermittent character. Three days after the iodoform was stopped the urine failed to give the iodine reaction. The recovery was rapid after this.

Throughout the patient was very freely stimulated with brandy and strychnine, and large doses of salol were administered to try to disinfect the intestines. It was about a fortnight before the fæces lost their foul odour.

The rupture was caused by pressure of the head against the promontory. The pelvis was a generally contracted one. Two of the patient's previous deliveries had been by forceps. I was not present at the delivery, but, I believe, considerable force was required. The child's skull was indented, but not fractured. There was no bleeding when the intra-uterine douche was given, and the fluid was returned quite freely. None of it seems to have gone into the peritoneal cavity. The retraction of the uterus must have closed the rent.

The diagnosis of the condition was very difficult, and we were not absolutely sure of it until the abdomen was opened. We had no doubt there was a lesion, but were not quite sure of its nature. An exploration of the uterine cavity would have settled the point, but to do that it was necessary to give chloroform, and I decided to open the abdomen at once without any preliminary exploration. The percussion evidence was very misleading, as it gave absolutely no indication that there was blood in the peritoneal cavity, and yet there was a considerable amount, both clotted and fluid. The clot was entangled in the omentum, and as it was evidently aseptic, I left a good deal of it behind.

The unhealthy condition of the patient's alimentary tract certainly predisposed to septic infection, and I believe the vagina was infected in that way. Fortunately this did not occur until the peritoneum was soundly healed over the stump of the cervix, and the infection was thus prevented from spreading beyond the cervical cavity. I think the temperature was kept up for about a week after the septic condition had subsided by the absorption of iodoform. There certainly was an immediate improvement when the use of the iodoform was stopped. I have seen the same kind of temperature in a case of concealed accidental hæmorrhage, where a very large plug of iodoform gauze was left in the uterine cavity for forty-eight hours after delivery. The case ran an aseptic course so far as the discharges were concerned, but the temperature remained up for some days.

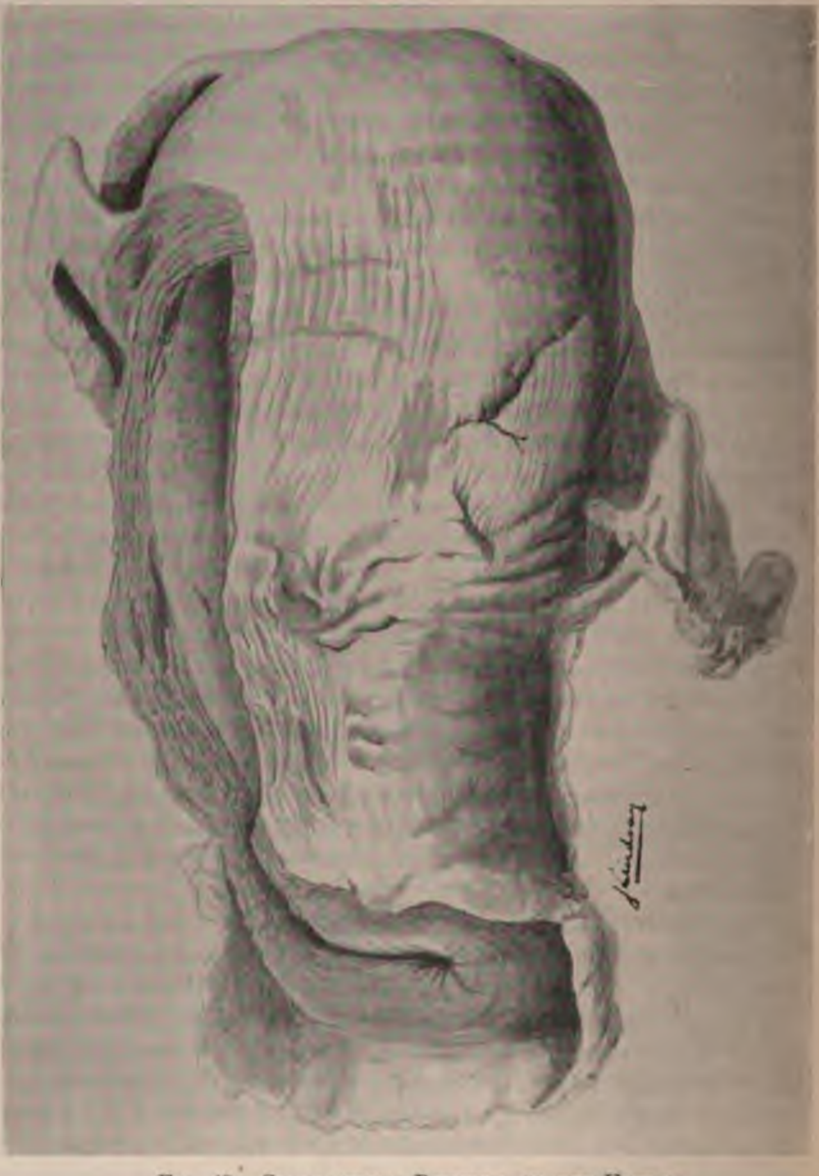

FIG. 49.—SPONTANEOUS RUPTURE OF THE UTERUS.

Spontaneous Rupture.—I have never seen a case of this during pregnancy, but the following one occurred during an ordinary unobstructed labour :

Case V.—Mrs. C., aged thirty-two, 7-para, was admitted to the Maternity Hospital from the outdoor department on account of slight ante-partum bleeding. On admission at 11 a.m. the discharge had ceased. The os admitted two fingers. The head presented in the first position. She was having regular pains, and the pulse was good. There was no overdistention of the uterus. The resident plugged the vagina.

I saw the patient at 12.30 p.m., and removed the vaginal plug. There was no bleeding, and the os had now dilated to about the size of a crown-piece. The membranes were intact, but there were no forewaters. The pains were increasing in strength. Careful palpation of the uterus showed that there was no internal hæmorrhage. She complained of some pain low down and to the left, but nothing abnormal could be felt there. As labour was apparently going on naturally, I advised leaving delivery to nature.

About 2 p.m., shortly after I had left the hospital, she had a violent pain, and screamed out that something had given way. She had three of these pains in quick succession, and then collapsed completely. The resident examined her at once, and found the os fully dilated and the head partly in the pelvis. The vaginal portion of the cervix was then intact. She was given a slight whiff of chloroform, and delivery effected with forceps. A large amount of clot and the placenta were at once removed. A large tear was felt extending right up the left side of the uterus from the cervix to fundus. The uterus and rent were plugged, and a saline infusion and stimulants given; but the patient died in a few minutes, just as I reached the hospital.

The uterus was afterwards removed through the vagina. The tear extended almost to the fundus on the left side (see Fig. 49). The vaginal portion of the cervix had evidently given way during the delivery, as the resident was sure it was intact when he applied the forceps. One would expect this to happen. To the naked eye the muscular fibres appeared pale, but the uterine wall was of normal thickness. A piece was removed and hardened in perchloride of mercury solution.

The following is Dr. A. R. Ferguson's report:

"Rupture of Gravid Uterus: Histological Examination and Report.

"(The solution was fixed in saturated solution of perchloride of mercury, and pieces of about 1 centimetre in diameter were afterwards embedded in paraffin and sectioned.)

"A certain amount of hæmorrhage is evident at and near the ruptured edge of the tissue, red blood corpuscles being observed lying in the interstitial tissue for a considerable distance remote from the ruptured edge.

"There is distinct evidence of degeneration of the muscle-fibres in the vicinity of the seat of rupture. Many are swollen and hyaline in appearance, nuclear staining in these being practically absent. Muscle-fibres of these characters are found in the uterine tissue at a considerable distance from actual seat of rupture.

"The muscle-fibres at the actual seat of rupture are, for the most part, atrophied and shrunken, and in many places exhibit transverse or irregular fractures of the muscle substance. Nuclear staining in the fibres is absent.

"The bloodvessels of the uterine wall appear healthy, though the perivascular lymph-spaces are, in most cases, occupied by red blood corpuscles.

"Some of the sections are specially treated to demonstrate the elastic tissue constituents of the connective tissue. It is observed that elastic tissue fibres are relatively scanty near the ruptured edge. In this situation they also stain more feebly than elsewhere. Many are broken up, and present slight irregularities of contour. No decided swellings or nodes in the course of any of these fibres can, however, be detected."

The etiology of spontaneous rupture of the uterus is somewhat obscure. In the *Centralblatt für Gynaekologie* for February, 1898, Dr. Michael Poroschin published a most interesting paper on this subject, founded on a case of incomplete rupture of the posterior uterine wall, caused by a fall on the back two days before labour had set in. The patient, 11-para, was forty-five years old. When admitted the os was beginning to dilate, and everything seemed normal, but when the contractions became stronger, she complained of pain in the abdomen, and became collapsed. The uterus was found to have increased in size, and there was some bloody discharge from the vagina. Concealed accidental hæmorrhage was diagnosed. The membranes were ruptured, and a large amount of liquor amnii evacuated. Delivery was effected by expression, and the uterus emptied of the placenta and clots by Crédé's method. The uterus soon contracted and stopped the hæmorrhage, but the patient died two and a half hours later. The post-mortem examination revealed a rather deep and long irregular tear of the posterior uterine wall, extending through the muscular tissue, but not involving the peritoneum. He considered that there had first been a slight rupture caused by the fall, and, as no large vessels had been involved, the bleeding had not been great; but as soon as the uterine contractions had become strong the tearing had increased, and the hæmorrhage became so great as to entirely separate the placenta and distend the uterus. In my case it is quite possible that a slight incomplete rupture had occurred before the patient was admitted. This would account for the hæmorrhage. I am led to think this likely, from the patient having complained of some pain low down and to the left of the uterus, irrespective of the uterine contractions. As careful palpation did not reveal anything abnormal, I did not attach any importance to her complaint. We got no history of any injury, but she may have overstrained herself in getting out of one of those high beds so common in working-men's houses. The bleeding had come on shortly after she had risen.

In Poroschin's case the uterus showed no special changes to the naked eye. Microscopic examination showed the muscle-fibres cloudy, slightly outlined, with pale-coloured nuclei. In the deeper layers of the torn muscle there was infiltration of blood, but neither the muscle-fibres nor the red corpuscles were changed. On examining the elastic tissue, he found it almost entirely wanting. Elastic fibres were only to be seen in the walls of the vessels, and there they looked rather angular, nodulous, and sometimes granular. The fibres were solid, without offshoots, and did not unite with one another. The elastic tissue of neighbouring vessels did not intermingle, and no offshoots passed into the neighbouring tissue. From this he concluded that the rupture was due to the want of elastic tissue.

In the *Journal of Obstetrics and Gynæcology of the British Empire* for February, 1902, Milne-Murray has described an interesting case, where complete rupture occurred at the very beginning of labour. He amputated the uterus and saved the patient. In 1866 Professor Simpson reported an almost identical case. In Milne-Murray's case the uterus presented no abnormality to the naked eye, and under the microscope the structure seemed perfectly normal, with no suggestion of fatty degeneration of the fibres. In Simpson's case there was marked fatty degeneration. In neither report is there any mention of the elastic tissue, and presumably no special staining was used to demonstrate its condition.

My case differs somewhat from Dr. Poroschin's in that the muscle-fibres were degenerated, while the elastic elements were present, but scanty and degenerated. I think there can be no doubt that the degeneration of the muscular fibres and elastic elements accounts for the rupture happening, without any extra strain having been thrown upon the uterus.

Treatment.—As spontaneous rupture occurs without any warning, prophylactic treatment cannot be adopted. After the rupture has occurred, the same treatment should be adopted as in rupture in obstructed cases. Removal of the uterus would probably be called for, and Milne-Murray's success would encourage one to try it, even in badly collapsed cases. In a case occurring, as Murray's and Simpson's did, at the beginning of labour, the abdomen should be opened as quickly as possible so as to be able to control the bleeding before the patient has become collapsed.

I saw a case of spontaneous rupture at the commencement of labour in a case of Dr. Munro Kerr's, where the cicatrix of a previous Cæsarian section gave way, and allowed the intact ovum to be extended into the peritoneal cavity. The fundal incision had been employed in the previous section. On both occasions the placenta had been attached to the fundus. This may have had something to do with the yielding of the cicatrix. The fundal incision cuts the muscle-fibres across, and when contractions begin, the strain upon the cicatrix must be much greater than when it is situated in the long axis of the uterus. The fundal incision will, I believe, be much more liable to give way than the anterior one.

Dr. Munro Kerr's case is fully reported in the *Journal of Obstetrics and Gynæcology of the British Empire* for November, 1904.

CHAPTER XXXII

MISSED LABOUR

Case—Retention *in Utero* of a Dead Fœtus: Case—Habitual Death of the Fœtus in the Later Months of Pregnancy: Cases.

PLAYFAIR, in his "Midwifery," says: "The term *missed labour* is applied to an exceedingly rare class of cases, in which, at full period of pregnancy, labour has either not come on at all, or, having commenced, the pains have subsequently passed off, and the fœtus is retained *in utero* for a considerable length of time. Under such circumstances it has usually happened that the membranes have ruptured at or about the proper time, and the access of air to the fœtus *in utero* has been followed by decomposition."

The causes of missed labour usually given are "abnormal absence of uterine irritability or of that residing in the reflex nervous centres, obstructed labour, and unusual close adhesions of the placenta" (Lusk).

The retention of a dead fœtus *in utero* up to term is not very uncommon, especially in twin pregnancies. I have already referred to several such cases, but the same condition may arise in a single pregnancy. Missed abortions have already been dealt with, and I shall shortly relate a case where, after a missed miscarriage, the patient retained the fœtus until full time.

A good many cases of so-called missed labour have been recorded, in some of which the fœtus had been retained *in utero* for many years. In the famous case of Dr. Cheston the period of retention was stated to have been fifty-two years. I agree with Bland-Sutton that this was really a retained extra-uterine gestation, and not a true case of missed labour. The late Dr. Angus Macdonald removed one horn of a bicornate uterus containing a fœtus which had been retained for a year. He maintained that all cases of missed labour were really instances of conception in one horn of a bicornate uterus, where there was an obstruction to the passage of the child, either from the canal of the cervix being too narrow or occluded. Other similar cases have been recorded.

There is no doubt that some of the recorded cases of missed labour have really been pregnancies in one horn of a bicornate uterus, or extra-uterine pregnancies, but some of them have certainly been instances of retention of the fœtus in the uterine cavity.

Diagnosis.—The fact that there is a fœtus in the uterus is easily ascertained, but the difficult point to decide is whether or not the woman has really gone beyond full time. If, at the expected time, the labour begins with the rupture of the membranes and then all contractions cease for weeks, one can be pretty sure of one's diagnosis.

Prognosis.—If the membranes have ruptured, the retained fœtus is sure to become septic, and the woman will run a very serious risk, but so long as the fœtus is non-septic she will run very little risk from its retention. The fœtus may macerate, but so long as air does not enter, it will remain non-poisonous to the mother. With a septic fœtus, ulceration of the uterus may occur, as in one case recorded by Sir James Simpson, where an opening formed into the transverse colon, and caused the woman's death three months after term.

Treatment.—If one is absolutely sure that the term has been passed the uterus should be emptied. This must be done with very great care, as the walls may be thinned out very much. If the fœtus is very much decomposed and coming away in bits, the uterus should be removed. Macdonald strongly advocated Porro's operation in all cases, on the supposition that all the cases were conceptions in one horn of a bicornate uterus.

CASE.—The patient was forty-two years of age, pregnant for the thirteenth time. I had delivered her twice before: the first time, in December, 1890, of her eleventh child, by means of high forceps; the next time, in 1893, of her twelfth child, by version, for prolapse of the cord. She had been menstruating profusely every three weeks for some time, until it ceased in the last week of May, 1894. She was quite sure of the date. In August her face, arms, and legs became very much swollen, but this passed off in a short time. She quickened at the usual time, but stated that the movements were never very vigorous. She was very much stouter than she had ever been in former pregnancies. On March 1, while stooping at the fireside, cleaning the grate, the waters suddenly gushed away from her in great quantity, flooding the whole floor. She felt no pain at the time, but felt slight movements. She had irregular pains after that for a day or so.

I was sent for on the 9th, eight days after the waters had come away. The fœtal heart could be faintly heard to the left and below the umbilicus, and she still felt slight movements. By palpation the head could be made out lying above the brim and to the left. *Per vaginam* the os would admit one finger, and the head could just be reached. There were no uterine contractions.

Next day the conditions were unaltered. She promised to send for me as soon as the pains commenced.

I heard nothing more about the case until the 27th, and had concluded that the labour had either ended naturally, or that they had sent to the maternity branch, as her former labours had been conducted in connection with it.

At noon of the 27th I found her having strong pains, and the head of a putrid fœtus presenting at the vulva. She stated that all movements had ceased the day after I had last seen her. She had remained in the same condition until the 23rd, when, as she termed it, she "began to alter," and this had continued. The discharge had been dark and foul-smelling. At 12 p.m. on the 26th the labour pains had begun.

The delivery was easily accomplished, and the placenta came away naturally. The fœtus, a male, apparently full time, was very soft and putrid, and the cord, which was 36 inches long, was quite black. The placenta was somewhat macerated, but did not present any abnormality. I gave an intra-uterine perchloride of mercury douche.

Next day she felt very faint, and was much troubled with flatulence, and had a bad headache, but the temperature was normal and the pulse 98. There was some pain over the uterus. She was poulticed and given quinine. After that she had no further trouble, and was up in about a week.

The case of occluded os with prolonged gestation, given on p. 215, might be classed as a case of missed labour. The patient had pains at term, and thought labour was coming on, but she was not delivered for nearly four weeks—305 days from the cessation of menstruation. Her child, however, lived until the time of delivery, but was too large to be extracted alive.

In the present case the "abnormal absence of uterine irritability" seems to me to have been the cause. This was brought about by the uterus having been overdistended and practically paralyzed. It must be borne in mind that this was her thirteenth pregnancy, so that overdistention would have a marked effect on her uterus. I did not see the woman before the escape of the waters, but she said she had been very much stouter than with any of her other children; and both she and her neighbours assured me that so much water came away from her that it flooded the whole floor. They estimated that there had been several basinsful. There is no doubt the quantity had been very great. The loss of the liquor amnii would account for the death of the fœtus, and the admission of air soon rendered it putrid. The labour came on, in all probability, at the time when a menstrual period would have occurred, had she not been pregnant.

Retention in Utero of a Dead Fœtus.—In dealing with missed abortion, the retention *in utero* of a blighted ovum has already been referred to. It is usual, when a fœtus perishes during gestation, for it to be retained for some days, or even weeks, but one occasionally meets with a case where the woman goes to full time, and even beyond it. How long a dead fœtus or a portion of conception may be retained *in utero* is very difficult to decide. This is a very important question from a medico-legal point of view. I have already referred to a number of twin cases, in which one of the fœtuses was retained dead *in utero* for between four and five months. I have seen several cases of single pregnancies where about the same time elapsed before the fœtus was expelled.

The following case is a typical one, and I was fortunate in seeing it at the time the fœtus perished, and being able to diagnose the condition. The case might be called one of *missed miscarriage*.

Mrs. A., a multipara, had always been attended by me at her confinements. When she was about three months pregnant she mentioned to me that she would probably need my services in the following July. When she was nearly six months gone I was sent for, as a small amount of bleeding had occurred. I found this was very slight. It was difficult to define the exact size of the uterus, as the abdominal wall was very thick. I failed to hear the fœtal heart, or to feel any fœtal movements. She said she had quickened at the usual time, but that the fœtal movements had only been felt for a short time. I told her I thought the fœtus was dead, but I could not be absolutely sure.

A few days' rest in bed stopped the bleeding. I examined her a month later, and found the uterus about the size of a five months' pregnancy. No fœtal heart and no movements were apparent. She said that she was sure she was not pregnant at all, as her abdomen had become smaller and her breasts quite flabby. I was now quite sure of my diagnosis. In considering the question of treatment, the patient volunteered the information that she had never felt better in her life, and she therefore did not relish the idea of any interference. I agreed with her that there was no reason for doing anything until she should reach full time, so long as she felt quite well and there was no discharge, but that, if the uterus did not expel its contents at full time, steps should be taken to empty it. I ventured to predict that, when full time was reached, labour would come on.

She kept perfectly well, and exactly at full time labour set in, and a small, macerated, five-month fœtus was expelled. The placenta was very adherent, and it was necessary to give her chloroform to clear it out. It was in a very degenerated fibroid condition. The patient made a good recovery. Except the degenerated condition of the placenta, there was nothing to show what had caused the death of the fœtus. There was no indication of syphilis.

This patient has since had a healthy child at full time

Treatment.—Some authorities say that so soon as you have diagnosed such a condition you should clear the uterus at once. I have never done this, and in quite a number of cases the results have been excellent. I think it is well to leave nature to deal with the condition, so long as there is no discharge or bad effect upon the woman's constitution, but to interfere if any discharge occurs, or on the slightest indication of the patient's health suffering. A discharge will indicate either that the uterus is attempting to empty itself, or that the membranes have ruptured and the ovum become septic. Then the sooner the uterus is cleaned out the better. I have always been struck with the fact that women with macerated fœtuses do not suffer much in health, and, as a rule, make perfectly good recoveries after delivery. We have many such cases in the Maternity Hospital, and hardly any of them have even a rise of temperature. A distinction must be drawn between a macerated and a septic fœtus. So long as the membranes are intact a macerated fœtus will not be a source of septic poisoning, but once let air gain admission, and a very virulent septic condition will probably arise. Then the sooner the uterus is cleared of its contents the better.

Habitual Death of the Fœtus in the Later Months of Pregnancy.—Syphilis has already been referred to as a frequent cause of death of the fœtus, but there are a certain number of non-syphilitic cases in which the fœtus perishes, usually in the later months of pregnancy. Time after time this may occur. The woman may apparently be in perfectly good general health. The placenta will invariably be markedly degenerate. Fatty, fibroid, and calcareous degeneration will be found present. The time of the death of the fœtus is usually about the same in one pregnancy after another.

Treatment.—If you are fortunate enough to get the patient to treat before she has again become pregnant, after one or more losses of this kind, you should investigate the condition of the uterus thoroughly, and treat any abnormal condition found. The endometrium will probably be in an unhealthy condition, and special attention should be paid to it, curetting it thoroughly if necessary. Most of the cases, however, come under treatment after conception has occurred. Very many years ago Sir James Simpson advocated treating such cases by giving chlorate of potash continuously throughout the pregnancy. His idea was that the chlorate would give up its oxygen to the mother's blood, and in that way the fœtal blood would be purified, even although the placenta were degenerated. As a matter of fact, the chlorate does not give up its oxygen to the blood, but it undoubtedly does good, probably by acting upon the endometrium, or decidua, as it then is. Theoretical therapeutists maintain that the continuous use of chlorate of potash for several months has a very deleterious effect upon the red blood-corpuscles. This may be true in theory, but in these cases it certainly does not work out so in practice. I usually administer it without bad result, in 10-grain doses three times a day, from the fourth month up to full time.

Case I.—A multipara was sent to me at the Maternity Hospital, when about six months pregnant, with the history of having had two previous still-births. We could find no evidence of syphilis, so decided to put her upon chlorate of potash. In her former pregnancies the fœtuses had died about the end of the seventh month. When she came near that time we took her into hospital to keep her under strict observation. Her abdomen was very much distended. There was a large amount of liquor amnii. One fœtus could be easily palpated, and one fœtal heart heard distinctly. She passed the critical time without the fœtus showing any indications of perishing, and as she was keeping well, we allowed her to go home, but told her to continue the chlorate. She was readmitted at full time in labour, and gave birth to a healthy mature child and a macerated premature one. The macerated one had evidently been dead before we put her on the chlorate, judging from its size, and the fact that no second fœtal heart had ever been detected.

Case II.—A multipara, who had had three still-born children at the eighth month, was sent to me, when about five months pregnant, for advice as to induction at seven and a half months, before the usual time of the death of the fœtus. As there was no indication of syphilis I advised her to take chlorate of potash regularly, and she did so. She went to full time, and was delivered of a healthy child by the nurses at her own home.

CASE III.—This patient has the most remarkable history of any woman I have ever attended. In 1888 I attended her in her fifth confinement, within six years of her first one. Except that the labour was a lingering one, there was nothing abnormal about it. The child was healthy, and is still alive. Within a year she had a miscarriage, and I had to give her chloroform to remove a very adherent placenta. In less than a year she had a premature labour with a putrid fœtus, and very nearly died of sepsis. When she next became pregnant I put her upon chlorate of potash, and she went to full time. The child was quite healthy, and is still alive. A few weeks after the child's birth she contracted scarlatina from her other children, but had a mild attack. In her next pregnancy she did not take the chlorate, and the result was a miscarriage. She soon became pregnant again, and I insisted on her taking the chlorate, and she went to full time, and was delivered of a healthy child; but this time she nearly died of what was apparently an air embolism (see Case I., p. 449). In her next pregnancy she took the chlorate, and went to full time again. Since then she has had two, if not more, miscarriages, when she was not taking the chlorate. Her labours are so difficult that she prefers miscarriages to going to full time, so I am afraid she will not take the chlorate again. If I had not had other cases, this series in the same woman would have quite convinced me of the efficacy of the treatment.

Since the publication of my cases I have had many communications from men in various parts of the country, and also from South Africa, telling me of cases successfully treated. I have also had others myself, and at present have a couple undergoing treatment. One or two cases have been reported where the children have suffered from enlargement of the thyroid gland, but no evidence has been brought forward to prove that the chlorate caused this.

CASE IV.—Mrs. McC., aged twenty-seven, 2-para. A little over a year ago this patient gave birth to a macerated fœtus at the seventh month. Movements had ceased a fortnight previously. The placenta was very much degenerated. There were no indications of syphilis in the patient nor in the husband.

About three months after the delivery I examined the patient, and found indications of slight endometritis. This was treated, and she soon became pregnant. From the third month onwards to full time she took the chlorate of potash in the form of tabloids. She was delivered at full time of a fine healthy boy.

Induction of labour is sometimes recommended in such cases. In the third case it would not have been practicable, because the fœtus invariably perished before a viable age. In the other three it might have been tried, but I doubt if it would have given good results. I tried it in one case in hospital, but the child, although born alive, only lived a few hours. In another case, which I saw in consultation, after the induction had been started, the child was born alive, and apparently healthy enough, but it died on the third day. I strongly advised a trial of the chlorate in this case, if there should be another pregnancy.

CHAPTER XXXIII

COMPLICATIONS OF THE PUERPERIUM

Urinary System—Abnormal Constituents of the Urine—Retention of Urine—Complete Suppression of Urine: Cases—Incontinence of Urine—Vesico-vaginal Fistulæ: Cases — Vesico-utero-vaginal Fistulæ — Uretero-vaginal Fistulæ.

AFTER a normal labour the puerperium should run its course without any complications, but unfortunately this is not always the case. Of course, complications are much more likely to occur after abnormal labours, but it is not an uncommon experience to have very serious complications arise where they are least expected. It will be convenient to discuss the complications, as far as possible, under the various systems of the body.

URINARY SYSTEM.

For the first few days of the puerperium there is a considerable increase in the quantity of urine excreted. The specific gravity is low. The absolute quantity of urea, phosphates, and sulphates is somewhat diminished, but the amount of chlorides is not altered. It gradually regains its normal quantity and quality. The following abnormal constituents are not infrequently found :

1. **Blood.**—After difficult instrumental labours blood is sometimes found. Its source of origin is from the mucous membrane of the base of the bladder. Injury to the mucous membrane of the bladder, during severe instrumental labours, is not uncommon. In a number of cases I have seen hæmorrhages into the mucous membrane. In cases of eclampsia large quantities of blood may be present, but in these it comes from the kidneys. As a rule the condition clears up of itself in a very few days.

2. **Albumin** is found in a large number of cases as a trace, and in a smaller number in much larger quantities. In some the urine

becomes quite solid on boiling. When there is a large amount it is usually associated with eclampsia. This has been discussed under eclampsia. It usually disappears in a few days, but will persist if chronic nephritis is present.

3. **Sugar** is very constantly found when the woman nurses. It is in the form of lactose. The amount varies, and it has been maintained that the quantity and quality of the milk may be judged by the amount of sugar found in the urine. Of course, you may have true diabetes in a puerperal woman, but this is exceedingly rare.

4. **Peptones** are said to be constantly found during the puerperium, especially after the first day. They are the products of involution, and disappear from the urine about the twelfth day.

5. **Acetone** is found when the fœtus is macerated. It probably arises from the absorption of some product of maceration. It is sometimes found in cases of eclampsia, and some observers have maintained that it is a cause of the fits, but this is undoubtedly a mistake. When it is found in eclampsia the fœtus is dead. It quickly disappears after delivery.

6. **Bile-acids** and **Bile-pigments** may be found in cases of catarrhal jaundice, and sometimes in eclampsia.

7. **Leucin** and **Tyrosin** are found in acute yellow atrophy of the liver. Bile-acids and bile-pigments will also be associated with them.

8. **Pus** is sometimes present. It may arise in the bladder or the kidneys. Cystitis is, unfortunately, not very uncommon. It may have been present during pregnancy, but it more frequently arises during the puerperium from want of proper care in cases of retention of urine. One cannot be too careful in the catheterization of these cases. From the bladder infection readily passes up the ureters, and finally the kidneys may become involved. The treatment of cystitis has already been alluded to.

In some cases the source of the pus may be one or both kidneys. In more than one case I have found old abscess of the kidney postmortem (see p. 433), and under affections of the kidneys an interesting case has been given in which the pyonephrosis was associated with a calculus. In cases of pyæmia, metastatic abscesses may form in the kidneys.

Retention of Urine.—This has already been mentioned. It may arise in a normal case, especially in a primipara, but is much more frequent after difficult labours if the perineum has been torn and stitched. Reflex irritation from the stitches may cause it, just as it so frequently arises after an ordinary secondary repair of the perineum, or after an operation for piles.

There is another factor in the causation. The bladder during pregnancy is drawn up into the abdomen and is considerably stretched, so that its tone is lost. After delivery the kidneys are usually very active, and the bladder soon begins to fill up. The patient often does not feel any desire to empty it for some time, until it is probably well distended. She is then unable to do so, as the power of contraction is lost to a considerable extent. For that reason the patient should always be encouraged to urinate a few hours after labour, before the bladder has become fully distended.

Fortunately, dribbling of urine or an overflow begins if it is not relieved. This prevents rupture, but it may lead the patient, or an unskilled attendant, to believe that there is incontinence of urine.

Diagnosis.—If the patient is unable to pass any urine no examination is necessary, but by placing your hand on the abdomen you can at once feel that it is distended by a pyriform tumour, probably larger than the uterus ought to be. If there is constant dribbling of urine, your hand on the abdomen should enable you at once to diagnose the condition. A vaginal examination is not necessary, nor is it advisable.

Treatment.—Pass a catheter and draw the urine off. The best catheter to use is either a glass one, or a long silver one which is solid beyond the eye. A gum elastic one is often used, but the sterilizing of it is exceedingly difficult. The instrument should either be boiled for a few minutes, or else be steeped for some minutes in lysol or other antiseptic solution. The vulva should be thoroughly cleansed and the meatus well wiped with swabs of cotton or clean rag wrung out of the antiseptic. The catheter should then be introduced by sight, having the labia well separated. The sleight-of-hand business under the clothing may seem clever, but it cannot be aseptic, and must therefore be condemned. It may be necessary to repeat the operation every six or eight hours for a day or two, but in many cases once is sufficient. A trained nurse can do it, but you will often have to do it yourself. If the condition continues for more than a few days, be on your guard against hysteria. I had a case of this kind in hospital. It was impossible to pass the catheter without giving the patient chloroform. After doing this for over a week I became convinced that hysteria was at the bottom of the condition, and I refused to allow the urine to be drawn off. She then passed it without any difficulty. On the other hand, I have seen a case where the catheter had to be used for twelve days, but that was after a difficult forceps delivery. Large doses of nux vomica, or of Easton's syrup, will help to strengthen the muscular wall.

The after-effect of retention of urine, especially in a neglected case, or in one in which sepsis has been conveyed into the bladder on the catheter, is almost sure to be cystitis. If it is promptly treated by washing out the bladder with boracic acid, and giving the acid by the mouth, it usually yields quickly.

Complete Suppression of Urine.—This condition is sometimes seen in fatal cases of eclampsia, but it also occurs in other conditions. One of my cases of Cæsarian section died of it. Shortly after the operation 3 ounces of urine were drawn off. It was very dark in colour, and showed evidence of carboluria. The peritoneal cavity had not been flushed out, but the gauze sponges used during the operation had been wrung out of carbolic lotion. An attack of bronchitis came on. Next day 9 ounces of urine were obtained. It was clear, but contained albumin and tube-casts. On the third day 11½ ounces were obtained in twelve hours, and in the next twelve hours only 2 ounces. From that time until death, over three days later, only 1 drachm of urine was got. The albumin had lessened considerably. The most active treatment was employed in the form of various diuretics, including diuretin, poulticing and cupping over the loins, hot vapour baths, saline diuretic infusion under the breast, bleeding to 10 ounces, and directly transfusing 1 pint of normal saline solution, and free purgation with salines and croton-oil. All was to no purpose. She gradually became more and more comatose, and there was a distinct urinous odour from her breath. Just before death she had a violent general convulsion of about a minute's duration.

At the post-mortem examination we found the abdominal and uterine wounds were practically healed. There was no indication of any inflammatory action. The pathologist, Dr. R. M. Buchanan, reported on the kidneys as follows:

"The right is of normal size; its capsule is slightly adherent, and its cut surface extremely hyperæmic. The hyperæmia is most marked in the pyramidal areas, which contrast with the pale yellowish-red streaked cortex. There is no hydronephrosis.

"Left: The upper end is flattened against the spleen. Its general appearance is similar to that of the right."

Microscopical Examination.—"A section of the kidney does not at first sight reveal any striking departure from the normal. On closer examination, however, the tubules of the cortex are seen to be almost uniformly dilated. The lumen of each tubule is occupied by a finely granular material, and the epithelium appears compressed. A considerable number of the straight tubules are also dilated and filled by the same material in a more coarsely granular form. There is no shedding of the epithelium, and no tube-casts are visible. The Malpighian bodies and the bloodvessels are normal.

"In the liver fatty degeneration is very manifest. There is also hyperæmia, involving atrophy of many hepatic cells in the central part of each lobule."

There was nothing in the kidney condition to account for the suppression, neither will shock account for it, as it did not supervene until fully three days had passed. I cannot venture upon any explanation.

The blood was submitted to Dr. Harris, assistant to the Professor of Physiology, for examination, and the following is his report:

"On March 17, 1898, I received from the Maternity Hospital, Glasgow, about 500 c.c. of clotted blood taken by venesection from the right arm of a woman who had been delivered by Cæsarian section on the 13th.

"I was told that the patient was then suffering from total suppression of urine, but as I was not informed what was the precise feature of the blood I was to examine into, and being myself more particularly interested in the interrelations of the pigments, I had time to make only some hurried investigation into the pigment present in the serum.

"As the clot contracted, a quantity of transparent serum exuded from it; this, alkaline in reaction, was notably yellower than is normal, and, as it contained a few red blood-corpuscles, I centrifugalized it, obtaining a perfectly limpid golden-yellow liquid. Examined with the spectroscope, this gave a very well-marked absorption-band at the F-line—*i.e.*, at the green-blue junction. In addition to this band I was greatly surprised to find the two bands of oxyhæmoglobin, showing that this serum, quite free though it was from red blood-cells, had, nevertheless, dissolved out a little HbO_2; the two bands at once gave way on treatment with NH_4HS to the single one of the reduced hæmoglobin.

"The band at F seemed to agree in position exactly with the published charts of 'spectrum of serum-lutein in serum' (as, *e.g.*, No. 24, Plate III., Schäfer's 'Text-book of Physiology,' 1898), but to be distinctly darker than the band due to the pigment of normal serum, regarded by some as 'lutein,' a lipochrome, but by M'Munn, whom I follow, as urobilin itself. Of course a band at or near the green-blue junction always suggests bile-pigment as much as it does urinary pigment, but there is, in this case, a presumption that the latter was present, and in excessive amount, because—

"1. The blood, on being warmed, smelt unmistakably of urine; this, to me a new experience, was very striking, as the odour was indistinguishable from that of somewhat stale urine.

"2. The chemical evidence for the presence of bile-pigments and bile-salts in the serum was by no means clear. Gmelin's reaction *did* give a blue-green colour, but not the subsequent 'play of colours' characteristic of bile-pigment; again, Pettenkofer's test yielded an orange-tinted froth rather than a true pink.

"3. There was no jaundice clinically. Now, I am aware that the urine shows traces of bile-pigment even before 'jaundice' can be pronounced to be present, and also that the spectroscope can detect bile-pigment when Gmelin's test cannot; at the same time, while not precluding a trace of bilirubin in this serum, I do not think that bilirubin accounted for the greater part of the pigmentation.

"4. On analysis of the serum by Gerrard's ureameter, the urea was found to be 0·2 per cent.; this is greatly in excess of its amount in normal serum. This is further presumption that products of renal excretion were present here to an abnormal degree.

"5. The left-sided extension of the band at F more nearly corresponded with the limits of the band of urobilin, as given in the majority of charts, than with those of the band of bilirubin.

"I am, unfortunately, not able to be more precise in my report; but taking a broad view of this fatal case, as it proved, of anuria, I believe we had here in the serum excess of the metabolites which the kidneys should have separated, notably the urea and the pigment, which latter is, in all probability, normally present in the plasma (and therefore in the serum) of circulating blood, being mainly derived from the katabolism of HbO_2 in the liver, whence the iron-free pigment passes on into the blood, quitting the liver as a kind of 'internal secretion.' This material being, however, an internal secretion that is *not* beneficial to the body, is normally eliminated by the renal epithelium."

Case of Suppression of Urine after a Normal Labour.—The patient, a primipara, aged nineteen, was delivered of a live female child, by natural efforts, after a labour of twelve hours' duration. On admission a catheter was passed, but the bladder was empty.

During the first few days of the puerperium a considerable quantity of urine was voided, but it was not examined, as it was contaminated with lochia. The patient did not complain of anything, but she had a grayish appearance, and looked decidedly ill. An examination of the heart, lungs, and pelvic organs gave a negative result. A catheter was passed on the sixth day of the puerperium, and about ½ ounce of urine was obtained. It showed a deposit of over one-third albumin on boiling, and the sediment contained great numbers of granular tube-casts. Previous to the passing of the catheter the urine had been freely excreted, but from that time onwards there was complete suppression, with the exception of 2 drachms obtained three days later.

Every effort was made to relieve the system by diuretics, cupping over the kidneys, hot packs, purgation, pilocarpine, and amyl nitrite, but without avail. She died on the fourth day of suppression. Towards the end the breath had a distinctly urinous odour, and hiccough and retching occurred. Just before death she had a slight convulsive seizure.

No post-mortem examination was allowed. The presence of granular tube-casts in the urine pointed to nephritis being present, but to what extent the kidneys were disordered it is impossible to say. It is a curious coincidence that the suppression dated from the catheterization, but it is difficult to see how that can have caused it.

Very little has been written on this subject, and in most obstetrical works it is not mentioned. In the *Journal of Obstetrics and Gynæcology of the British Empire* for April, 1902, Dr. McKerron, of Aberdeen, has reported three cases of his own and three others, one of Dr. McCrea from the Canadian *Lancet* of 1884, one of Dr. J. T. Williams from the *Lancet* of 1886, and the third of Dr. F. F. Bond from the *Lancet* of 1899. Two of McKerron's cases recovered, but all the others died. No post-mortem examinations were obtained. Dr. Boxall has given notes of two more fatal cases in the May number of the same journal. In one of his a post-mortem examination was obtained. "The kidneys were enlarged, very much congested, and showed evidence of old-standing disease of moderate degree, and also of recent acute inflammatory softening." In my case the pathologist gave a decided opinion that there was nothing in the kidney condition to account for the suppression. In Dr. Boxall's case there certainly was.

Prognosis.—The condition is an exceedingly grave one. Death usually occurs in from two to five days from the onset.

Treatment.—Free purgation, diuretics by the mouth and subcutaneously, hot packs, cupping, and poulticing over the kidneys—

in fact, every means must be taken to establish diuresis and diaphoresis. For the latter pilocarpine may be used, but only if the lungs are clear. If the patient has much pain, do not give her opium.

Incontinence of Urine.—After severe operations this condition may arise. The sphincter has been paralyzed by pressure, and you have a continuous dribbling of urine. A modified form is sometimes seen in patients who have a cough. The urine is involuntarily expelled at each attack of coughing.

The *diagnosis* of the condition is easy, as there is a constant flow of urine. You must satisfy yourself, first, that it is not an overflow from retention, and, second, that it is not a case of vesico-vaginal fistula. In the first condition you have a large tumour in the abdomen, and on passing a catheter you draw off a large quantity of urine. The second condition, as a rule, does not appear until at least ten days after labour, when incontinence is hardly likely to be present. You must bear in mind, however, that there is a possibility of a fistulous opening having been made into the bladder during labour. The diagnosis between the two conditions will be given when we deal with vesico-vaginal fistulæ.

Treatment.—The sphincter usually regains its tone within a few days (without any special treatment). The patient should be kept as dry and comfortable as possible. If the condition persists more than a day or two, a tonic treatment of strychnine and iron should be adopted.

Vesico-vaginal Fistulæ.—Fistulæ are now not nearly so common as they were years ago. Forceps used to be blamed for causing them, and undoubtedly fistulæ did often follow the use of forceps, but this was due, not to the use of the instruments, but to their not having been used soon enough. The timely use of the forceps has done more to prevent fistulæ than anything else. They usually arise in cases where the head has lain in the pelvis for a long time, thus subjecting the vaginal wall to prolonged pressure. The vitality of the compressed tissue is thus lowered, and sloughing occurs. As the slough will not separate in less than about ten days, urine will not begin to flow continuously from the vagina until the second week of the puerperium. This is the rule, but still, there are exceptions to it, just as there are exceptions to the rule of prolonged pressure always being the cause. An immediate opening may, of course, be made by the unskilful use of an instrument like the perforator, or by spicules of bone during delivery after craniotomy; but the following case illustrates how the urethra may be split up into the bladder, even in an ordinary forceps case. A primipara was delivered with forceps after some difficulty. The child's head was extra large, and the occiput specially broad and square. The perineum was only slightly torn. There was some tearing of the anterior vaginal wall, but there was no bleeding. There was a very poor light in the room, so I did not attempt to make a careful examination. When I called some twelve hours later I found the patient lying soaking in urine. The bladder was undistended, and a careful examination revealed that the urethra was split in its upper part, just at the point where it left the bladder. The tear was nearly 1 inch long. The great breadth of the occiput had so stretched the anterior vaginal wall that it had burst, involving the urethra longitudinally. As it was impossible to do anything in the patient's house, I decided to wait until I could take her into hospital, which I did twelve days later. A few days after admission I repaired the tear, and it healed at once.

The following case illustrates how very severe pressure, even though it may not be very prolonged, may cause a fistula: The patient, a primipara, was suffering from eclampsia. She had a contracted pelvis with a true conjugate of 3½ inches. Delivery was effected in the Walcher position with axis-traction forceps. A great deal of force was used, but the child was born alive. About the twelfth day of the puerperium urine began to come away from a large fistula, which would admit two fingers. I think that the eclamptic condition probably had something to do with the formation of the fistula. The vitality of the skin in eclamptic patients is so low that a hot-water bottle which would only be comfortably warm to an ordinary patient may cause a burn. I have constantly to warn the nurses against allowing a hot-water bottle to touch the skin in cases of eclampsia. I think that the vaginal mucous membrane is probably in the same condition, and if that is the case it would account for this fistula having formed, although the pressure lasted only a very few minutes. It must, however, have been pretty severe, as the child was fairly large.

Diagnosis of a Vesico-vaginal Fistula.—In many cases there will be little or no difficulty, as the opening can be easily felt. It can also be seen when the perineum is drawn back with a speculum. The bright red mucous membrane of the bladder can usually be observed protruding. The urine will be seen to flow from the opening. If it were a case of incontinence or overflow from an overdistended bladder, the urine would be coming from the urethra. When the opening is very minute there will be more difficulty in the diagnosis. You will not be able to feel or see it, but if you fill the bladder with a coloured fluid and expose the anterior vaginal wall by means of a speculum, the coloured fluid will be seen trickling through the opening. The fluid should be aseptic. Boiled milk is one of the best to use.

Treatment.—If the opening is small, it may close of itself, but this cannot be counted on. If it is one which has formed during the labour, it should be stitched at once. When it forms in the ordinary way, time must be allowed for the surrounding tissues to become healthy, so that the operation cannot be done until well on towards the end of the puerperium. In the first case, referred to on p. 410, I did the operation on the fourteenth day of the puerperium, but there the edges of the wound were healthy, as there had been no sloughing. In the second case it was not done until about the sixth week.

The surrounding parts are often in a very septic condition, so the patient must be prepared for some days by having the external parts shaved and cleansed, and the vagina and bladder well douched with boracic lotion. For the operation special instruments have been devised, such as very long-handled bistouries, straight and angled, right and left, and long-toothed forceps. An ordinary narrow-bladed bistoury, a pair of sharp-pointed scissors, dissecting forceps, and a few pairs of ordinary artery forceps, a bladder sound, a needle-holder, and small curved needles, a good duck-bill speculum, a douche and a catheter, are all that you require. Silver wire sutures were formerly much used, but horse-hair or fine silkworm-gut ones are better. With the patient in the lithotomy position, the anterior vaginal wall is fully exposed to view by a broad duck-bill speculum. Some operators prefer to have the patient in the Sims' position, and others in the genu-pectoral. The sound is passed into the bladder, and the edges of the wound are then to be pared all round, special care being exercised at the angles. The hæmorrhage can be controlled by a stream of hot water. Only the mucous membrane of the vagina is to be pared. The sutures should then be passed, in such a way as not to include the mucous membrane of the bladder. They should go down to it, but not through it. They must be put close together, and special care must be taken at the angles of the wound. When they are tied, the bladder should be filled with coloured fluid to see if it is quite tight. If it leaks, more stitches must be inserted. A retention catheter is recommended by some, but it is not necessary, and may irritate the bladder and do harm. The urine should be drawn off in from four to six hours, and as soon as the patient can pass it herself allow her to do so. The stitches may be removed in ten or twelve days. To facilitate their removal they should be left long. The bladder should then be again tested with coloured fluid. If there is any leakage, the sinus may be closed at once, provided the parts are quite healthy, but, as a rule, you will have to delay operating for a week or two.

The operation is not entirely free from risks. If the mucous membrane of the bladder is pared it may bleed profusely, and, again, if the stitches are passed through it, serious bleeding may occur into the cavity after the opening is closed. If the fistula is a large one—*i.e.*, broad in the transverse direction—one or both ureters may be caught in the stitches at the point where they penetrate the bladder wall obliquely. If such an accident occurs, the patient will soon begin to complain of severe renal pain and to show uræmic symptoms. In that case the stitches must be removed at once.

Sometimes you may get a better result by a flap-splitting operation—*i.e.*, by separating between the vaginal and vesical mucous membrane all round. This is especially the case if the fistula is large, as you do not then require to remove any tissue.

In very extensive fistulæ where the base of the bladder is almost entirely destroyed, the body of the uterus may be utilized to close the opening, as practised by Freund. He opened Douglas's pouch and drew the retroflexed uterus into the vagina, and scraped on both sides until it bled. This rawed surface was sutured to the freshened edges of the fistula, so as to close the gap. To allow of the escape of menstrual blood, he then removed a wedge from the fundus uteri. Sometimes the cervix has been stitched into the opening to close it. Menstruation will then occur through the bladder. In women beyond the menopause the vagina may be closed entirely, the urethra, of course, being left free.

Vesico-utero-vaginal Fistulæ.—These open close against the cervix, which frequently has its anterior lip partially or completely destroyed. They are caused either by extensive sloughing, or, more frequently, by a tear of the cervix extending into the vaginal vault and bladder. Such an accident may happen in attempting to deliver through an undilated cervix. When due to a tear, partial healing takes place in the lower part of the cervix, but an opening remains into the cervical canal and another into the vagina.

Treatment.—When due to tears they may heal spontaneously, especially if touched with silver nitrate. When an operation is required, an incision should be made in the anterior fornix, and the cervix and bladder separated until you get above the fistula, taking care not to open into the peritoneal cavity. The edges of the fistula should then be pared down to the vesical mucous membrane, and the gap closed by sutures, as in the ordinary vesico-vaginal variety. You may use buried sutures of catgut, and then close the opening in the vaginal vault, or use silkworm-gut ones, and leave the vagina incision to granulate.

Vesico-uterine Fistulæ.—These are caused in the same way, either by tearing or sloughing. If the opening is small, the patient will probably pass some urine naturally, and this may lead to the erroneous conclusion that the fistula communicates with one of the ureters, and not with the bladder. This point is easily settled by injecting milk into the bladder. If it is a vesical fistula, the milk will run out of the cervix, and if it is ureteral none will appear.

Treatment.—The operation is exactly the same as that described for vesico-utero-vaginal fistulæ. You should close the cervical opening if you intend to close the incision in the vaginal vault, otherwise you may leave it to granulate.

Uretero-vaginal Fistulæ.—In these the opening is between a ureter and the vagina. It will be high up in the vaginal fornix. The urine will be observed to trickle from a small raised papilla. A probe can be passed into it. If the bladder is filled with milk it will not discolour the urine discharged from the sinus.

Treatment.—An attempt should be made to repair the opening by rawing the edges and stitching it, but before doing this it is necessary to make sure that the part of the ureter between the fistula and the bladder is patent. This can be done by passing a probe downwards into the bladder or upwards from the bladder. If it is blocked, no attempt should be made to close the fistula from the vagina. If you fail to close it from the vagina, or if the lower part is impervious, you may implant the ureter into the bladder. To do this an abdominal section will be necessary. The ureter must be divided at the fistula, and the end of it freed sufficiently to allow of its attachment to the bladder. A small opening is then made in the bladder wall, and the end of the ureter drawn into it by means of a long slender pair of forceps, which have been passed up by the urethra and through the opening. It is then stitched in position.

In the event of this failing, extirpation of the kidney will have to be seriously considered, but this should only be undertaken as a last resort.

CHAPTER XXXIV

COMPLICATIONS OF THE PUERPERIUM—*Continued*

Recto-vaginal Fistulæ—Central Tear of the Perineum—Prolapsed and Inflamed Hæmorrhoids—Fissure of the Anus—Injuries to the Vagina—Uterine Complications—Laceration of the Cervix—Cases—Inversion of the Uterus—Cases—Displacements of the Uterus—Prolapse—Retro-displacements.

RECTO-VAGINAL FISTULÆ.

THESE are more frequently caused by direct tearing than are the vesical ones. When the perineum is completely torn the rectum is involved, and the tear may extend for a considerable distance up its anterior wall. Tears of the vaginal wall are often present without the rectum being involved, unless the perineum has gone too. I have often found deep tears which have passed down by the side of the rectum, and not into it. The surrounding loose cellular tissue tears much more readily than the muscular tube, so the rectum often escapes. If the fistula is caused by pressure, it will be some days before the slough separates, just as with the vesical. The opening may be in any part of the vaginal wall. The entire posterior wall, including the perineum, may be destroyed, thus forming a cloaca.

If the opening is large, fæces will be passed by the vagina, but if it is small, flatus alone may pass. The flatus is usually passed with a peculiar bubbling or hissing sound, and as the patient has no control over it, she is often greatly embarrassed by it occurring at undesirable times. It may cause her great distress of mind.

The *diagnosis* is usually easy, unless the opening is very minute. The opening can be both felt and seen.

Treatment.—When there is any tearing of the vaginal walls during labour they should at once be carefully stitched. When the perineum and posterior vaginal wall are torn into the rectum, the parts should be thoroughly cleansed and repaired. The rectal wall should first be closed with catgut sutures passed from the bowel and tied inside.

Then, when the bowel is closed, the vaginal wall and perineum should be closed also. Silkworm-gut sutures are the best for the perineum, and they should be passed deeply in. Provided that sepsis does not supervene, the parts will heal completely.

The bowels should be moved on the third day by castor-oil, and they should not be allowed to become constipated.

Small fistulæ will occasionally heal spontaneously if kept clean, but a plastic operation will usually be required.

Operation.—When sloughing has ceased and the surrounding parts are healthy, the patient should be prepared by having the bowels well cleared, and the vagina douched with a non-poisonous antiseptic for several days before the operation. If the fistula is high up, it can be exposed by drawing the perineum back when the patient is in the lithotomy position. The edges should be pared and the recto-vaginal septum split with a blunt dissector for from ¼ to ½ inch all round. This enables you to bring the rectal part and the vaginal part together with separate sutures. The rectal part is closed by interrupted catgut sutures passed through the submucous tissue, but not including the mucous membrane. They are tied and cut off short, and buried by the next row of sutures which close the vaginal part. The rectal sutures are sometimes passed from the bowel and tied inside the bowel. Silkworm gut may be used for the vaginal sutures; they should be removed in about ten days. The bowels may be left undisturbed for a week, and then cleared by an olive-oil injection.

When the fistula is close to the sphincter, the best way is to cut through the remains of the perineum and then split up the recto-vaginal septum, as in doing a Tait's operation on the perineum. The rectal wall should first be closed with catgut sutures, passed from within the bowel, tied and cut short. The vaginal wall is treated in the same way. The operation is then finished like an ordinary repair of the perineum, by passing from four to six deep silkworm-gut sutures. Before tying these the raw surface should be very carefully cleansed with 1 to 2,000 perchloride of mercury solution, for fear it may have been contaminated from the rectum.

Central Tear of the Perineum.—The presenting part of the child occasionally passes through the centre of the perineum. In most cases the tear extends forwards into the vulva, making a complete rupture, but occasionally this does not occur, and a central rupture is left.

The following case is the only one I have ever seen :

Fourteen years ago this patient was attended in her first confinement by two students from the Maternity Hospital. The patient says that the tear occurred then, but the students, if they observed it, failed to report it, as the labour is entered as a normal one. The present confinement is her eighth. When the head was at the vulva a band of tissue was seen to be stretched over it, and the nurse slipped this towards the left side, when the head was at once expelled. The eight children have all been born through the abnormal opening, as the normal vulvar cleft has evidently never been distended.

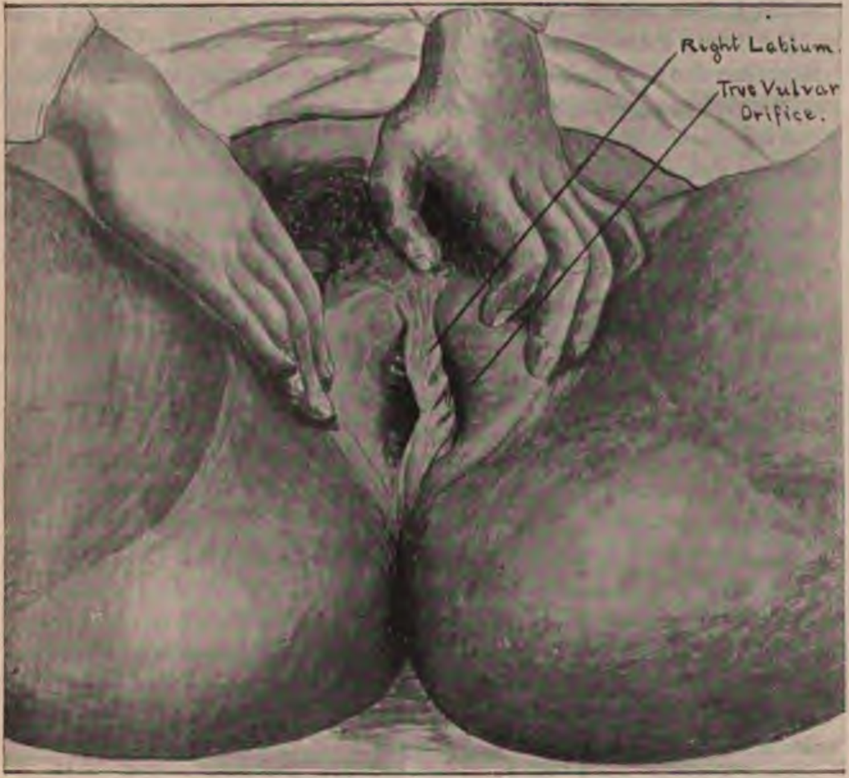

FIG. 50.—OLD CENTRAL RUPTURE OF THE PERINEUM.

At her first labour the head evidently came through the centre of the perineum, and the tear, instead of passing into the vulva, had extended forward, completely separating the right labium minus along its junction with the labium majus. The tear extends as far forwards as the clitoris. The condition does not cause the patient any inconvenience. Until the parts are separated you would hardly notice anything was wrong.

I am indebted to my friend Dr. John Lindsay for the excellent drawing. Besides doing the drawing, Dr. Lindsay has furnished me with the following extract from an article on "Generation," in Harvey's works, which is very interesting, although we cannot subscribe to his conclusion as to the cause :

"A white mare of great beauty had been presented to Her Serene Highness the Queen, and in order that its symmetry and usefulness might not be impaired by foal-bearing, the grooms, as is the custom, had infibulated the animal with iron rings. This mare (by what chance I know not, nor could the grooms inform me) was got with foal, and at length, when no one suspected anything of the kind, she foaled in the night, and a living foal was found the next morning by the mother's side. When I heard of the circumstances I went immediately to the place, and found the sides of the vulva still fastened together by the rings, but the whole pudendum on the left side so thrust and torn away from the pelvis by the almost incredible efforts of the fœtus that a gap sufficiently wide was made to admit of its escape. Such is the force and vigour of a full-grown and healthy fœtus."

A similar condition may arise from an ordinary torn perineum which heals in front and behind, but fails to unite in the centre. If the opening is a very small one it will probably close of itself, especially if the edges are touched with pure carbolic acid, but if it does not, the front bridge of tissue should be cut through, and an ordinary repair done by rawing the edges and stitching the parts carefully.

The immediate repair of a central tear would not differ from that of an ordinary tear, except that you would probably have to cut through the anterior bridge of tissue to get the vaginal tear properly closed.

Prolapsed and Inflamed Hæmorrhoids.—A very large number of confinement cases suffer from hæmorrhoids. The pressure of the presenting part is very liable to cause engorgement and prolapse of the lower part of the bowel. If the hæmorrhoids are much congested, the patient will suffer great pain from them, and probably have retention of urine.

Treatment.—Hot fomentations should be applied to relieve the congestion, and if there is much pain morphia suppositories or sedative ointments should be used. As soon as the bowels are thoroughly cleared the suffering is usually relieved.

Fissure of the Anus.—The rectal mucous membrane is very often fissured during the passage of the head. In the majority of cases the fissures heal without causing any trouble, but occasionally a very painful condition is left behind. As a rule the patient does not complain of the pain until some time after the confinement. If she has pain she probably considers it arises in the vagina, and she expects it to come right shortly. Occasionally, however, the suffering is so great within a day or two after the confinement that the patient complains bitterly of it. I have seen one marked case of this. The fissure was so painful that large doses of morphia failed to give relief, and I had to chloroform the patient and stretch the rectal sphincter thoroughly. This was effectual.

Treatment.—Put the patient deeply under chloroform, and thoroughly stretch the sphincter so as to paralyze it. Cutting through the base of the fissure is an older method of treatment, but I think the stretching is better, provided always it be thoroughly done.

Injuries to the Vagina.—Fistulæ and lacerations have already been dealt with. In most cases of labour there is more or less injury to the vagina. It may be either in the upper part of the canal or in the vulva. Lacerations about the vestibule, though small, may give rise to considerable hæmorrhage. The plexus of veins which lies there is very apt to be varicose, and if it is opened into the bleeding will be profuse. In such a case stitching is necessary. I have seen several cases in which stitching was required. If the tear is near the urethra, care must be taken not to include it in a stitch.

Although the vagina may not be lacerated, the mucous membrane may be injured by the pressure of the presenting part. If the parts are kept perfectly aseptic, no bad results will follow, but if septic organisms gain a footing a *puerperal ulcer* will form. It will present a grayish, sloughing base with an inflamed margin. There will be a profuse foul discharge, and the temperature and pulse will rise.

The *treatment* consists in thoroughly cleansing the part, and applying pure carbolic acid to the ulcer, and then dusting it with iodoform powder. Vaginal douching in such a case may do harm by carrying some of the putrid material into the uterus. To allow of free drainage, the upper end of the bed should be raised or the patient propped up. One application of carbolic will usually be sufficient, but the ulcer should be kept clean and have iodoform applied daily until it heals. The slough will separate in a few days and leave a clean, healthy surface.

Uterine Complications.—Some of these—viz., after-pains, subinvolution, superinvolution, and fistulæ—have already been referred to (Chapters XIII. and XXXIII.).

Laceration of the Cervix.—This is an accident which is apt to happen in any case in which delivery is effected before the os is fully dilated. In treating of hæmorrhage, cases have been referred to. While it is apt to happen in cases artificially delivered, it also occurs in natural deliveries. If you were to examine all your cases, you would find more or less tearing of the cervix in a large number of them, especially among primiparæ. With even a fairly large bilateral tear there may not be much bleeding, but if the uterine artery, or a large branch of it, be torn, the hæmorrhage will be very severe, and may even prove fatal. If the tear extends beyond the cervix, the uterine artery is very liable to be torn. A small tear in the cervix in a case of placenta prævia may cause excessive post-partum hæmorrhage. These cases have been referred to in dealing with placenta prævia.

The immediate risk from a tear of the cervix is hæmorrhage, while the remoter risk is the greater liability to septic absorption.

The *diagnosis* can easily be made by touch, and also by drawing down the cervix and inspecting it. In a case of post-partum hæmorrhage, if the uterus is well retracted, one should at once suspect laceration of the cervix.

Treatment.—In slight cases natural repair will occur during the puerperium, but if the tear is deep, if it is not stitched, the cervix will remain permanently fissured and probably require a secondary repair. When the tear is large, even if there is no hæmorrhage, it should be stitched at once. The parts are so dilated that it is quite easy to do this. By drawing down both lips the cervix can be exposed and the stitches easily passed with a curved needle. Catgut, which will not absorb under a week, makes a very suitable suture. The stitches must be tied tight, as the tissues will be œdematous.

The three following cases may be taken as illustrative :

Case I.—A primipara, after a natural labour, was found to have something protruding from the vulva. On examining this, the house surgeon discovered that it was the anterior lip, and that there was an extensive bilateral tear in the cervix. There was no bleeding. I put five or six stitches in each side. At the end of the puerperium healing was complete.

Case II.—In a case of induction of labour in a contracted pelvis delivery had to be effected with forceps. The cervix was lacerated towards the left side. Considerable bleeding continued during the douching, so the laceration was stitched with chromic acid catgut. This completely stopped the bleeding. When the patient left the hospital the cervix was healed, but the stitches had not absorbed. I removed them six weeks later, and they were as sound as when put in. I have since delivered this patient of another live child by induction with forceps without tearing the cervix.

CASE III.—This patient had an exceedingly pendulous abdomen. The cervix had evidently been badly torn in one of her former labours. The anterior lip was very œdematous, and protruded at the vulva. The child, which weighed 11½ pounds, was delivered alive with axis-traction forceps, but with the utmost difficulty. The uterus retracted well after the placenta was expelled, but copious bleeding continued, evidently from the cervix. I at once plugged the uterus and cervix with iodoform gauze, and the vagina with aseptic wool. This controlled the hæmorrhage completely. On removing the plug next day there was no bleeding. In this case plugging was preferable to stitching, as there was no single fresh laceration of the cervix.

In a few rare cases, a ring of the cervix is torn off by the advancing head. I have never seen a case of this kind, but Hirst records two. Extreme rigidity of the lower part of the cervix—*i.e.*, of the part immediately round the os externum—seems to be the cause. In Hirst's cases there was no excessive bleeding, and the patients did well. If bleeding does occur, the bleeding-points should be caught and tied if possible, and, failing this, the uterus and vagina should be very firmly plugged.

Inversion of the Uterus.—This usually happens during, or shortly after, the end of the third stage of labour, but it may occur later during the puerperium. Fortunately it is a rare occurrence. In 51,290 cases in the Glasgow Maternity Hospital it only occurred three times, and of these two recovered. In the fatal case there was the further complication of placenta prævia. The accident occurred in the hands of a midwife, and as the patient did not die for six days, sepsis was probably the cause of death. The following two cases are the only ones I have seen :

CASE I.—Mrs. C., aged twenty-two, 2-para, was attended by a midwife. The labour had begun about 1 a.m., and the child had been born at 4.30 a.m. About twenty minutes after the birth of the child a strong expulsive pain had brought something away. The midwife said that she had not pressed on the fundus or pulled on the cord. When the mass appeared at the vulva she lifted the placenta off, as it was not attached to the inverted uterus. There was no great bleeding, but the patient became frightfully collapsed. I saw her half an hour later, and found her just breathing her last. The inverted uterus lay between her thighs completely outside the vulva, so the vagina was inverted as well as the uterus. There had not been much hæmorrhage. Death had evidently been caused by shock. There was nothing to account for the inversion. The patient had apparently been quite healthy, and had been going about as usual on the evening before the labour came on. The labour had been quite natural, and I am pretty confident the midwife had not made traction on the cord. The cord was an ordinary length. So far as I could make out, the placenta had been attached to the fundus. From the midwife's description of the third stage, the uterus seems to have remained in a state of inertia for nearly twenty minutes, and then to have suddenly contracted very violently. She said there was only one expulsive pain. Possibly the weight of the placenta attached to the fundus of the relaxed uterus had caused the fundus to sag down, and when the contraction had come on the placenta and fundus had been caught, and the inversion completed. The violence of the contraction had probably inverted the vagina and separated the placenta at the same time.

Case II.—Mrs. P., aged twenty-one, 2-para.

This patient's first pregnancy had ended at the seventh month in a premature labour with a still-born child. When three months pregnant the second time she had been threatened with an abortion. During the later months of the pregnancy she had suffered from profuse leucorrhœal discharge, so bad at times that it used "to drop on the floor." When labour began the membranes ruptured. Some hours later, when Dr. Christie, her medical attendant, saw her, the os was the size of a shilling. Some eight hours later, when the os was fully dilated, the pains began to weaken, so he administered chloroform and delivered with forceps. The delivery was easy, but the perineum ruptured. The child was alive. During the third stage Dr. Christie kept his hand on the fundus, but did not press firmly upon it. The placenta was soon expelled, but the membranes were attached to a body which also appeared at the vulva, and which Dr. Christie at once recognised to be the inverted uterus. He quickly stripped the membranes off and pushed the body back into the vagina, compressing it to stop the hæmorrhage. The patient at once showed signs of extreme collapse. Brandy was promptly administered.

When I reached the patient, about an hour later, she was very collapsed, but had rallied slightly. She had lost a good deal, but not an alarming amount of blood. Her pulse was barely perceptible at the wrist. She complained bitterly of a terrible bearing-down pain. She was at once given $\frac{1}{30}$ grain of strychnine, and Dr. Sinclair, who was also present, gave her a normal saline infusion of 2 pints under the right breast, while Dr. Christie administered chloroform and I reinverted the uterus. It was completely inverted. With my fingers in a cone shape I pressed the centre of the fundus up, and as soon as she went deeply under the chloroform I felt the constricting ring yield, and the remainder of the reinversion was quickly accomplished with the closed fist. I then stripped off and removed several pieces of adherent membranes and gave a copious lysol douche. Two stitches were put into the perineum. A hypodermic of ether was given, and frequent doses of brandy by the mouth. The pain disappeared entirely after the uterus was reinverted. Twelve hours later she had rallied considerably. On the fourth day her temperature rose to 103° F., but an intra-uterine douche of lysol quickly brought it down to normal. Beyond suffering from retention of urine for five days, she had no further trouble.

In this case there was no question of traction upon the cord, or undue pressure from above. It looks as if the inversion had been caused by the firmly adherent membranes dragging the fundus down as the placenta was expelled. The placenta had apparently not been adherent.

Causes.—In spontaneous cases there is probably at first complete inertia of the uterus. The placenta remains attached (it may be adherent), and from its weight, especially if it be attached near the fundus, it drags down the uterine wall. When a contraction comes on, if the inverted portion is caught, the process will be continued until the body of the uterus is forced into the vagina. If the vagina also is inverted the body will protrude at the vulva. The most frequent cause of inversion is either traction on the cord, or pressure on the fundus from above. In such cases inertia must be present, or the uterine wall could neither be pulled nor pushed down. If the uterus were at all retracted, the cord would break, or the placenta tear off, before inversion could be caused. It is occasionally caused during the puerperium by severe straining at stool.

Symptoms.—There is a sudden indication of profound shock, accompanied by some hæmorrhage. This will probably have been preceded by a strong expulsive pain.

Diagnosis.—If the hand is placed on the abdomen no uterine tumour can be felt, and if the abdominal wall is at all lax, a groove is felt where the uterus should be. A vaginal examination will at once reveal a mass in the vagina or protruding from it. The placenta, if not previously expelled, will still be attached or lying on the mass. Care must be taken not to mistake a fibroid polypus for the uterus. If the protruding mass is a polypus you should still be able to feel the uterine tumour in the abdomen, and to pass a sound into the cavity of the uterus by the side of the mass.

Prognosis.—It is a very grave condition. The patient may die from shock or hæmorrhage in a very short time, and if the inversion is not quickly relieved she may die from exhaustion, from repeated hæmorrhage, or from sepsis.

Treatment.—If the inversion is only partial, spontaneous reduction may occur, but we must not reckon on this. Reduction should be attempted at once. In the majority of cases, if the attempt is made within a few hours, success will follow. After forty-eight hours the chances are that you will not succeed, and it is then probably better to wait until involution has taken place, unless sepsis has set in, when the uterus should be removed.

If the placenta is still adherent, some advise that it should be left, but I think it should be peeled off. The uterus should first be thoroughly cleansed. If the operation is done immediately, chloroform may not be necessary, but if a few hours have passed it should be administered. Taxis should be applied by the hand, and not with instruments. The central taxis, as first described by McClintock, is the one most frequently used in recent cases. The closed fist is steadily pushed against the fundus until the uterus is reinverted, and the hand is kept inside the organ until retraction has taken place. A second method is to grasp the uterus in the hand, and while compressing, push it upwards and forwards in the pelvic axis. Another method is to grasp the body in the same way, and then press firmly upwards with the thumb on the anterior part of the mass. Whichever method is used, care must be taken to press in the axis of the pelvis, or the uterus may simply be driven against the promontory of the sacrum. If some time has elapsed manual taxis will probably fail. Vaginal tampons sometimes succeed. Pinard considers Champetier de Ribes' bag possesses advantages over all other plans. The bag is filled in the vagina, and by its pressure it gradually reinverts the organ.

When the reinversion is accomplished an antiseptic intra-uterine douche must be given at once. To combat shock the patient should be freely stimulated and a large saline infusion administered.

If the circulation has been interfered with, gangrene of the uterus will occur, and in such cases, and in those which are very septic, total extirpation by the vaginal route should be done at once.

In cases where you fail by taxis or by elastic pressure involution should be allowed to occur before making further attempts. The tendency of the present day is to deal with these cases by abdominal section, or anterior colpohysterotomy. By the abdominal route the cervical ring may be dilated, or, if this is impossible, the posterior uterine wall may be incised longitudinally, and then stitched after reposition has been effected. If reposition is found impossible, hysterectomy should be performed.

DISPLACEMENTS OF THE UTERUS.

Prolapse of the Uterus.—The commonest displacement is prolapse. It is liable to occur if a patient rises before the uterus has involuted into the pelvis. The ligaments have not had time to come back to their normal state, and the weight of the organ causes the prolapse. It is specially liable to occur if the perineum has been torn and not properly repaired. In some cases, however, the perineum may remain intact, and yet there may be considerable injury to the pelvic fascia, which will allow the uterus to descend. The following case illustrates this. I delivered a primipara by axis-traction forceps of a very large child. It was a persistent occipito-posterior position, but the perineum was not torn. She did not rise until involution was complete, and after being up for a few days, she had an attack of rheumatism, which confined her to bed for six weeks. When she began to move about after this the uterus prolapsed, so that the cervix appeared at the vulva.

The treatment in these cases is to support the uterus with a ring pessary, and make the patient rest as much as possible. The great preventative is not to allow a woman to get up until the uterus has involuted into the pelvis.

Retro-displacements.—In the early stage of prolapse there is more or less posterior displacement of the fundus, but this not infrequently occurs without any prolapse. Pads under the abdominal binder are said to predispose to this, but as they are only used in the first day or two of the puerperium, when the uterus is above the promontory, and cannot be displaced backwards, I cannot see how they can possibly have any effect. If they are used after the fundus has fallen below the promontory, they may then certainly be injurious. Overdistention of the bladder will be very apt to cause displacement.

The chief factor is undoubtedly the relaxed condition of the ligaments, especially the round ligaments. After an attack of para- or perimetritis, it may arise from the contraction of adhesions drawing the fundus back.

The *treatment* is to replace the uterus, and keep it in position by means of a suitable pessary. If an inflammatory condition is present, it must first be dealt with.

If the patient has suffered from a displacement previous to or during the early part of the pregnancy, a Hodge or Albert Smith pessary should be inserted as soon as the uterus has involuted into the pelvis.

CHAPTER XXXV

COMPLICATIONS OF THE PUERPERIUM—*Continued*

Conditions of the Uterus and Adnexa arising from Septic Absorption—How the Organisms gain an Entrance—Septicæmia—Pyæmia—Sapræmia—Pelvic Cellulitis or Parametritis—Pelvic Peritonitis or Perimetritis—Cases of Sepsis.

CONDITIONS OF THE UTERUS AND ADNEXA ARISING FROM SEPTIC ABSORPTION.

THIS subject is a very wide one, but I shall endeavour to deal with it as concisely as possible. One can hardly say that the pathology of this condition has been thoroughly worked out. Much still remains to be done, but the science of bacteriology has thrown a great deal of light on the subject, and has revealed to us many things which were unknown to our predecessors. We now know that micro-organisms are at the bottom of all septic mischief, and that, as a rule, they or their products gain an entrance into the woman's system during the labour or shortly after it. In a few rare cases they are present in the system before labour. I shall illustrate this by a number of cases.

The term "puerperal fever" is a very misleading one, and it should be banished from our nomenclature. As Semmelweis long ago pointed out, the condition is simply that of blood-poisoning occurring in a puerperal woman. The only effect the puerperal condition has on the disease is to render it more virulent. The patient's blood is very hydræmic, and the organs of absorption and excretion are fully taxed to dispose of the products of involution, so it is easy to understand why blood-poisoning is so apt to be serious.

Various organisms have been identified in the discharges—*e.g.*, the streptococcus, the staphylococcus, the colon bacillus, the gonococcus, the *Bacillus pyocyaneus*, the *Bacillus fœtidus*, the pneumococcus, the Klebs-Löffler bacillus, and the tetanus bacillus. The streptococci are probably the ones most frequently found, but in many cases the infection is a mixed one. These organisms act directly on the system, and give rise to septicæmia or pyæmia. On the other hand, sapræmia, which may be looked upon as a milder form of sepsis, although in some cases it may be fatal, is caused, not by direct invasion of the tissues by organisms, but by the absorption of their products—*i.e.*, of ptomaines. These ptomaines are produced by the action of saprophytic organisms on the dead animal tissues which are present in the birth canal.

As has already been stated, vaginal bacteria proper have the power of destroying even the most virulent of these organisms, but their power is limited, and if the invading organisms are too numerous or too powerful, the victory must go to the stronger.

How the Organisms gain an Entrance.—In the great majority of cases the germs are conveyed into the genital canal by the examining fingers or instruments, at the time of labour or during the puerperium, and gain an entrance through the lymphatics in septicæmia. The external genitals and perineum must swarm with all sorts of organisms, and if these parts are not thoroughly cleansed, it is impossible to guard against introducing some of the organisms when making an examination or applying instruments. However careful one may be in sterilizing one's hands and instruments, if care is not also exercised in cleansing the external parts, organisms are sure to be introduced. The truth of this has been demonstrated to me over and over again in my hospital work. When we admit a patient who has been examined outside in the usual way without having had the external genitals cleansed, we almost invariably find the temperature rises slightly in most, and considerably in some. The following case will illustrate this :

A primipara, with a conjugate vera of slightly under 2¾ inches, was admitted to the Maternity Hospital in labour. The membranes were unruptured, and the child alive. It was clearly a case for Cæsarian section, but I learned that she had been examined several times by different men before she was sent in, and as evidently no care had been taken to cleanse the external genitals, I decided not to do a section. Craniotomy was performed with the most rigid antiseptic precautions, and although there was no laceration of the parts, she developed acute sepsis within two days. Had I done a section she would have been dead within forty-eight hours.

Sepsis may be conveyed through the vulvar napkins or the domestic sponge, which old women are so fond of using to cleanse the patient with. Many patients have been infected by the douche when given with an old enema syringe.

Infection from drains may undoubtedly arise, as the following case well illustrates: The patient, a primipara, was delivered by a nurse after an easy natural labour. The room she lay in was on the ground-floor of a tenement, where a new system of water-closets was being built. A few hours after delivery the workmen opened the drain which ran through the entry. Within three hours the patient had a violent rigor, and when I saw her shortly afterwards her temperature was 105° F. She was removed to the Fever Hospital as soon as possible, but she died of septicæmia a few days later. The opened drain was opposite the door of the house in a narrow entry, and within a few feet of her bed (see also case of phlegmasia alba dolens, p. 453).

The retention of any part of the secundines will predispose to sepsis, as the air swarms with saprophytic organisms, ever on the watch for a suitable nidus.

It has recently been maintained that pathogenic organisms may be retained in the interstices of the endometrium during pregnancy, and set up sepsis after labour. I have never seen a case of this kind, but I have seen several where old abscesses were undoubtedly the sources of infection. These abnormal cases will be described later.

Puerperal Septicæmia.—*Symptoms.*—As a rule, nothing wrong is noticed during the first twenty-four hours after labour. During the second or third day of the puerperium, or it may be later, the patient has a rigor, and the pulse and temperature rise. The chances are that you will be told that the patient has had a chill. To the lay mind this explains the matter. The patient may have been exposed to a draught, or her room allowed to get too cold, but will this be the cause of the seizure? There is no doubt that exposure to cold or a draught, by lowering the vitality, will predispose to sepsis, but it cannot arise unless the organisms are already there, ready to begin their fell work. In the same way I believe worry and anxiety, or great mental excitement, will predispose a woman to septic invasion.

With the general disturbance we have also local manifestations. The lochia become scanty or are suppressed, the vagina grows hot and tender, and there is considerable tenderness over the uterus. Involution ceases, and the uterus may even become larger than it was, and lose its feel of firmness. The milk secretion is checked. The patient's tongue becomes furred, and she suffers from headache. Vomiting may occur, and in many cases diarrhœa sets in. The abdomen often becomes tender and distended, showing that general peritonitis has set in. A scarlatinal rash sometimes appears over the wrists and elbows. The temperature and pulse will remain very high. The pulse is a better index of the patient's condition than the temperature. In some cases the temperature may remain low, even subnormal, and yet the pulse be very high. Such a case is likely to prove fatal. The patient will often be restless and delirious, but you occasionally see a case where the woman, although, from her general appearance, manifestly very ill, yet maintains that she is feeling quite well. Such a case generally ends fatally.

In some cases septic pneumonia will be set up, and the heart is likely to be affected. In others insanity may develop.

The disease may prove fatal in a day or two, but it sometimes lasts for as long as three weeks.

Diagnosis.—As a rule, the condition can be only too easily recognised by the high temperature, quick pulse, rigors, pain in the abdomen, and change in the lochial discharge, etc. The onset of any of the exanthemata may mislead one. Of these, enteric fever used to be the most difficult to diagnose, as its symptoms are almost identical with those of acute septicæmia, but, thanks to the Widal method of examining the serum, we are now able to settle the diagnosis early.

Prognosis.—The condition is an exceedingly grave one.

Treatment.—Prevention is always better than cure, and in this case it is markedly so. There are a few cases in which the disease cannot be prevented, but in the great majority there is no doubt that preventative measures will prove effective.

In the first place, the surroundings of the patient should be in a sanitary condition, and the labour should be conducted on aseptic principles, with as few vaginal examinations as possible. The labour must not be allowed to linger on until the woman is completely exhausted, and care must be taken to have the uterus completely emptied. During the puerperium perfect cleanliness must be insisted upon. If proper precautions are taken there is little risk of the disease. When it does arise, we have to deal with a constitutional as well as a local condition, and we must, therefore, adopt constitutional as well as local treatment.

The first thing to do is to get the bowels well cleared. A full dose of calomel, followed by a saline or an enema, does well. For the high temperature quinine is, in my opinion, the best antipyretic. It should be given in full doses, say 10 grains,* followed by 5 grains every four hours. If the patient suffers from much pain, 5 grains of

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* I have recently been trying 1 grain of calomel with each dose of quinine until the patient has had three or four doses. This combination does very well.

Dover's powder should be combined with each dose of quinine. If the pulse is quick, free stimulation will be necessary. Strychnine given hypodermically makes the best cardiac stimulant, and it should be used freely when the heart shows any signs of flagging. In bad cases good old brandy or whisky should be given freely, not in teaspoonful, but in one to two tablespoonful doses every hour or two. The patient must be given as much fluid nourishment as she can take, in the form of milk, soups, beef extracts, etc.

Local Treatment.—The uterus must be very thoroughly douched out, and any portions of membranes, placenta, or decidua should be carefully removed with the finger. Curetting is not advisable. Any antiseptic may be used in the douche, but perchloride of mercury (1 in 2,000) is the best. The douching should be finished with boiled water to wash out as much as possible of the albuminate of mercury, which deposits on the endometrium. Poisoning has occurred, but I have never seen a case. The temperature often rises after the douche is given, and a rigor frequently occurs. If the douching has done any good, the temperature should fall in a few hours. If necessary, intra-uterine douching should be repeated daily, and, in addition, the nurse may give a vaginal douche later in the day. Poultices or stupes over the uterus have a soothing effect.

The infusion of a pint or two of normal saline solution is usually very beneficial to the patient. It dilutes the poison and also assists its elimination. The infusion may be repeated several times if necessary.

As regards the use of antistreptococcic serum there is considerable difference of opinion. In pure streptococcic infection it is useful, but in mixed infection, as in the majority of cases, it is questionable if it will do much good. If possible, a culture should be made from the interior of the uterus before resorting to the use of the serum, but this cannot always be done. In some cases I have seen very remarkable improvement following its use, while in others it has had no effect.

Total extirpation of the uterus has been strongly recommended by some, but the results have not been very brilliant. By removing the uterus you remove the source of infection, but the general system has become so poisoned that the patient is apt to sink from the operation.

Pyæmia.—This condition is caused by the same micro-organisms as cause acute sepsis. The infection usually takes place through the clots in the uterine sinuses, and spreads through the general circulation as these clots break down. It may also arise from neglected sapræmia. To all intents and purposes it is a chronic form of septicæmia.

Symptoms.—It differs from septicæmia in that it does not, as a rule, arise until the second week of the puerperium. The course of the puerperium may have been quite normal up to, say, the tenth day, or there may have been some febrile disturbance from sapræmia. The patient is seized with a severe rigor, and the temperature rises to 104° or 106° F., with a correspondingly quick pulse-rate. In a few hours the temperature falls, and may come down to normal, and the patient may seem all right, but in twelve or twenty-four hours other rigors follow at short intervals, and the temperature varies between 100° and 105° or 106° F. Each rigor indicates a fresh infection in some part of the body.

In from three days to a week or so the points of infection become apparent by metastatic abscesses forming. These may appear in nearly any part of the body. They may appear in superficial parts, as subcutaneously, or in the joints, or in the deeper parts, as the liver, lungs, kidney, and brain. If the abscesses occur in a position where they can be promptly opened, the patient, if she does not die of exhaustion from prolonged suppuration, may recover, but if they are in deep organs, or if a septic pneumonia, pericarditis, endocarditis, or peritonitis is set up, she will probably die.

Diagnosis.—Rigors, with an oscillating temperature, occurring late in the puerperium, make the diagnosis easy. It may be mistaken for enteric fever, or *vice versâ*, but the Widal reaction soon settles the point. The occurrence of the abscesses would, of course, be definite.

Prognosis.—It is a very grave condition, but if the abscesses are superficial, the chances are in the patient's favour.

Treatment.—Support the patient's strength by the free use of alcohol and plenty of easily digested food. Quinine, strychnine, and large doses of iron are useful. As regards douching, it will do more harm than good, except where there is a septic endometritis. In such a case the uterus should be thoroughly washed out and curetted, and then plugged with iodoform gauze. Wherever abscesses form they should be evacuated and thoroughly drained. If they form in a joint, open them as soon as possible, to prevent destruction of the joint.

Antistreptococcic serum has been used in these cases with some success, and in bad cases it should certainly have a trial.

Sapræmia.—This condition arises from the absorption of the products of decomposition—*i.e.*, of ptomaines. Saprophytic organisms are always present in the atmosphere, and gain entrance to the vagina in every case, but they can do no mischief unless there is a fair amount of dead tissue for them to act upon. There must always be some dead tissue to come away from the uterus as the remains of the deciduæ and clots from the uterine sinuses are cast off, but with free drainage these are not allowed to lie in the vagina, and, therefore, the saprophytes do not get time to act upon them. Under ordinary conditions the normal vaginal bacteria, if they have not been disturbed by injudicious douching, may be counted on to deal with the saprophytes.

Symptoms.—About the third day of the puerperium the temperature rises to 101° or 102° F., and the pulse quickens proportionately. The patient may not feel very much out of sorts, but the lochial discharge will be found to be fœtid. If she is promptly treated she may be all right next day, but if matters are left to take their course, the temperature will gradually rise higher, rigors will occur, and the patient will become very ill. By this time the organisms will have made their way up from the vagina into the uterus to the dead tissue of the endometrium and the clots in the sinuses, and a septic endometritis will be set up. These organisms, which at first were only able to act on dead tissues, are said to change into more virulent forms, and attack the living tissues. The lochia will be very foul and profuse, thus differing from the lochia of septicæmia, which is scanty and not fœtid. The septic condition may further spread through any laceration of the cervix into the broad ligament of one or both sides, and set up a cellulitis, or through the Fallopian tubes and set up a perimetritis, which may go on to a general peritonitis and prove fatal. Another result may be a general pyæmia.

Diagnosis.—Fœtid lochial discharge is the distinguishing feature of sapræmia.

Prognosis.—If promptly treated, the patient should always recover. If it is neglected she may die, and even if she recovers, there will probably be some bad effects in the form of subinvolution, adhesions, etc., left behind.

Prophylactic Treatment.—Conduct the third stage of labour so as to prevent the entrance of air to the vagina, and to ensure that the uterus is thoroughly emptied and well retracted before applying the binder. Also, ensure thorough drainage by ordering the patient, if she possibly can, to micturate and defæcate in a sitting posture. On the first indication of symptoms give a vaginal antiseptic douche, and also wash out the uterus, but before passing the nozzle into the uterus be sure that you have very thoroughly washed out the vagina, otherwise you may carry infection into the uterus. I prefer washing out the uterus as well as the vagina for the reason that if only a vaginal douche is given, the first flow of the douche may have forced some of the organisms up into the cervix, and, besides, one can never be sure that they have not already invaded the uterus, especially if there is anything retained in it. It is well always to make a careful examination to see if there is any membrane, etc., protruding from the cervix. If there is, remove it. I have more than once found a piece of membrane, the removal of which has been followed by an immediate fall of the temperature. Where the interior of the uterus is affected, after a copious douche has been given, a thorough application of iodine by means of cotton wool is a most useful method of treatment. I use equal parts of the tincture and liniment of iodine. The tincture alone is not strong enough. The interior of the uterus should first be wiped dry with wool swabs. Curetting is not advisable. The patient's bowels should be freely cleared by an active purge. A few doses of quinine are also very useful, as you get not only the antipyretic and tonic action, but also an action upon the uterus, which causes expulsion of any dead matter lying in it. Free drainage should be ensured by raising the head of the bed or propping the patient up. Free purgation, while relieving the system of some of the poison, also assists drainage, especially if the patient is allowed to sit up to stool. The importance of free drainage of the vagina and uterus was impressed upon me a good many years ago in one of my cases in the outdoor department of the Maternity Hospital. The patient had a very adherent placenta with a macerated fœtus. She lost a great deal of blood. The result was that bad sapræmia began, and she refused to allow douching. On the evening of the second day of the attack, when her temperature was 103° F., I found her sitting at the fireside. She said she would not recover if she stayed in bed. Next morning her temperature was normal, and she made a good recovery. The uterus had emptied itself, and the source of infection had been removed by her assuming the erect posture. Of course, it would be a mistake to order a patient suffering from sapræmia to get out of her bed, but it is almost as bad a mistake to keep her lying perfectly flat on her back.

In sapræmic cases, if the vagina has been much bruised or lacerated, a puerperal ulcer is apt to form. This has already been dealt with on p. 409.

Pelvic Cellulitis or Parametritis.—This condition has already been mentioned in connection with sapræmia. It is the result of absorption through a laceration in the cervix. As the left side of the cervix is more commonly torn than the right, a left-sided cellulitis is more frequent than a right-sided one. There is more or less cellular tissue along all the ligaments of the uterus, but the chief masses lie between the folds of the broad ligaments of either side. While the seat of the inflammation is usually at the side of the uterus, it may be in the front or behind. One or both sides may be affected. A hard mass becomes deposited, and pushes the uterus towards the opposite side of the pelvis. There is great tenderness in the part. In most cases resolution slowly occurs. There will generally be some contraction of the ligaments left behind, and these will cause displacement of the uterus. In a number of cases, however, suppuration occurs in the mass, and a pelvic abscess results. The abscess may burst internally, in which case the result will be fatal, but the pus more frequently makes its way to the exterior through the vagina, bowel, or bladder. It may also come to the surface in various positions, as above Poupart's ligament, in the thigh, in the back, etc.

Symptoms.—As it is always the result of septic absorption, you have indications of sepsis by high temperature, quick pulse, and rigors, with severe pain in the pelvic region. At first there will be heat and tenderness in the vagina, but very soon a hard, tender mass will be felt pushing the uterus aside. The patient will lie with the leg of the affected side drawn up, as this will give her most ease. When suppuration occurs there will be repeated severe rigors.

Diagnosis.—Indication of sepsis, and in a very short time a hard mass to be felt in the pelvis.

Pelvic Peritonitis or Perimetritis.—This arises in much the same kind of cases, but instead of the inflammation being confined to one part of the pelvic tissue, it involves the whole pelvic peritoneum. The infection has spread through the tubes. It may not confine itself to the pelvic peritoneum, but may spread through the peritoneal cavity and set up general peritonitis.

The *Symptoms* are much the same as with cellulitis, but the pain is over the whole pelvis, and not confined to one side. When the effusion has taken place the whole pelvis will be found to be full of a firm mass all round the uterus. It feels much the same as if plaster of Paris had been poured into the pelvic cavity and allowed to set round the uterus. The patient will lie with both legs drawn up.

Absorption generally occurs, but adhesions are often left behind, and as these contract they may pull the uterus out of its normal position, and be a great source of trouble. In some cases, however, suppuration occurs, and the abscess discharges itself in the same way as a cellulitic abscess does.

Diagnosis.—There are the same indications as with cellulitis, only the pain in the pelvis is more general. When the effusion is present, the whole pelvis will be found to be full of a hard mass, fixing the uterus in position.

Prognosis.—Both with cellulitis and peritonitis the prognosis is good as regards life, but troublesome adhesions are frequently left behind.

Treatment.—The treatment of both conditions is the same. With thorough aseptic precautions these cases should not occur, but when they do occur both general and local treatment must be adopted. The patient's strength must be kept up by means of nourishing diet and stimulants. The bowels must be thoroughly cleared, and to relieve the pain hot stupes or bran poultices should be applied over the pelvic region. Morphia suppositories may be necessary. For the fever quinine is useful. When the acute stage is over, hot vaginal douches should be given, and ichthyol and glycerine tampons inserted to promote absorption. If suppuration occurs, the abscess should be opened and thoroughly drained through the vagina, or wherever it is pointing. The vaginal route should, as a rule, be selected, as this will be the lowest point.

A hydrosalpinx, a pyosalpinx, or an abscess of the ovary may result. With either of these the best treatment is to remove it by abdominal section. The vaginal route is not very suitable, as there are likely to be many adhesions.

Cases of Sepsis.

Case I.—*Septicæmia, treated by Antistreptococcic Serum—Recovery.*—E. R., unmarried, primipara, aged twenty-one, admitted in labour with the breech presenting. The pelvis was contracted. The labour progressed naturally for some hours, and then the patient had an epileptic seizure which lasted for a few minutes. She was given chloroform, and delivery effected with some difficulty by traction. The child was still-born. The perineum and posterior vaginal wall were lacerated. Two stitches were put in the vagina and three in the perineum.

Next day the patient had two more fits. In the second one she shouted loudly. The urine was found to contain a small quantity of albumin and blood, and some granular tube-casts. She was given chloral and bromide to control the fits.

Until the third day her temperature was satisfactory, but it then rose to 104° F. The lochia were fœtid, and the posterior vaginal wall was covered with a grayish slough. The sutures had given way in it and the perineum. The patient was listless and stupid, but complained of little beyond a headache. Her tongue was foul, but her bowels were regular. An intra-uterine douche was given.

On the fifth day the uterus was curetted, and the temperature fell from 103·2° to 97·2° F. There was considerable hæmorrhage. Next day the temperature rose to 104° F., and the patient began to complain of pain in the abdomen, especially on palpation. The fundus was at the level of the umbilicus, and towards the right. She had a slight epileptiform seizure on the sixth day, and was very much excited afterwards.

She was removed to the Fever Hospital on the eighth day of the puerperium. On admission there her temperature was 103·6° F.

Next day she was restless and "heady." There was a copious fœtid vaginal discharge. Her temperature was 105° F. Forty c.c. of antistreptococcic serum were injected between the scapulæ. Next day there was no improvement. She was restless and delirious, but by the following day the temperature had fallen considerably and the pulse slowed down. For three days the temperature remained normal, and it then suddenly rose to 104·6° F. She made no complaint, and seemed quite comfortable. For a week the temperature fluctuated between 101° and 106° F., and it then became normal, and remained so. She occasionally complained of headache during the pyrexia, but of nothing else.

She was dismissed quite well twenty-five days after admission to the Fever Hospital. Besides the antistreptococcic serum, she was given vaginal douches of creolin, and iron, stimulants, and sedatives as required.

The antistreptococcic serum seems to have had a beneficial effect in this case.

Case II.—*Septicæmia, treated by Antistreptococcic Serum—Fatal.*—N. B., unmarried, primipara, aged twenty-two.

The head presented L.O.A., and the labour ended by natural efforts, but a portion of the membranes was adherent, and had to be removed by the hand. There was a brisk post-partum hæmorrhage, which was checked by a hot douche. The temperature was 100° F. at the time of delivery, and it steadily rose to 102° F. on the second day, 103·6° F. on the third day, 104·6° F. on the fourth day, and 105·6° F. on the fifth day. The uterus was douched out on the second day.

On the fourth day the posterior vaginal wall was covered with a grayish slough. Quinine reduced the temperature about 3°, but it quickly rose again to 105° F.

She was sent to the Fever Hospital on the sixth day. Her temperature on admission there was 105·4° F., and her pulse very weak and quick. The fundus was about two-thirds distance between the pubis and the umbilicus, and very tender. She was very prostrate. Forty c.c. of antistreptococcic serum were injected between the scapulæ. Six hours after injection the temperature had fallen to 101·4° F., but it soon rose again to 105° F. Next day the uterus was curetted, but no débris found in it. Twenty c.c. of the serum were injected, and the temperature quickly fell to normal. Next morning the temperature was normal, and she felt comfortable, but at noon she had a rigor lasting fifteen minutes, and the temperature rose to 105·2° F. at 2 p.m. Her pulse was 180, and very soft. She was very prostrate and delirious.

Two days later there was no improvement, and 40 c.c. of serum were administered. The temperature fell to 100·2° F., but she remained restless and delirious, and complained of headache. She died on the following day, eleven days after delivery.

Besides having the serum administered, she was curetted, douched, freely stimulated, and had opium as required. The serum certainly reduced the temperature, but it did not prevent a fatal issue.

CASE III.—*Septicæmia and Pyæmia—Recovery.*—Mrs. G., 1-para, aged twenty-nine, was sent into the Maternity Hospital by a medical man on account of the pelvis being contracted. She was in labour, but had not reached full time. The diagonal conjugate measured 4 inches. The head presented transversely, with the occiput to the right, and the posterior parietal bone lower than the anterior. She was delivered by version. The after-coming head was somewhat difficult to get through, and there was a marked depression in the left parietal region. The child was alive, but suffered from right-sided convulsions for several days. These then ceased, and the depression disappeared. There was pretty severe post-partum hæmorrhage before the placenta came away, so it was removed by hand. The perineum was partially torn, and required stitching. An intra-uterine douche was given.

A few hours after delivery the patient had a rigor, and the temperature rose to 103·4° F. and the pulse to 100. Next day the temperature fell to 99·2° F. and the pulse to 96. From that time until the sixth day of the puerperium, when she was removed to the Fever Hospital, the temperature varied between 100° and 104° F. The lochial discharge was fœtid. The uterus was douched out daily, and on the third day a blunt flushing curette was used. An emulsion of iodoform was injected into the uterus after douching. On the fifth day she had profuse diarrhœa, and the conjunctivæ showed a distinct icteric tinge. She was removed to the Fever Hospital on the sixth day of the puerperium.

On admission to the Fever Hospital her temperature was 102·4° F. She was anæmic and sallow. She did not complain of any pain. The uterus was felt just above the pubis, and was not tender. The os was patulous, and there was a slight foul discharge. Next day she was distinctly jaundiced, and the stools were clay-coloured. For several days the temperature gradually fell, and then became irregular. The anæmia was now so marked that it was pernicious in appearance. There was still a foul discharge from the uterus.

On the nineteenth day of the puerperium she had a severe rigor, and her temperature rose to 104° F. For the next six days she had a rigor, generally in the evening, and a fortnight later there was marked general swelling and œdema of the right leg, with tenderness and bulging in the right flank. In a fortnight the œdema of the leg had diminished and the bulging in the flank quite disappeared.

A month later she was dismissed from the hospital, still with some slight swelling of the right leg.

The treatment adopted throughout was douching, and she was freely stimulated and given arsenic.

The onset in this case was so soon after delivery that she must have been infected before admission. The case was apparently one beginning with acute septicæmia and ending in pyæmia. Although she had repeated rigors, no metastatic abscesses formed. The anæmia, arising primarily from the post-partum hæmorrhage, undoubtedly prolonged the course of the disease, and it is surprising that the patient recovered.

CASE IV.—*Pelvic Cellulitis, ending in Suppuration—Fatal.*—The following case of cellulitis is rather an unusual one, from the rapidity of its onset, and from the fatal issue with the formation of pus within five days of delivery :

J. G., unmarried, 1-para, aged nineteen, was admitted to the Maternity Hospital on January 7 in labour. She was suffering from a cough, with considerable bronchial catarrh. The head presented in the third position. After she had been twenty-eight hours in labour forceps were applied, and the child delivered with the occiput posterior. The child was still-born. There was considerable laceration of the cervix, vagina, and perineum. An antiseptic intra-uterine douche was given immediately after delivery. The day following delivery the temperature rose to 103° F., and the pulse to 130. In the evening the temperature fell to 99·4° F. Next day the temperature rose again to 103° F. The lochia were very foul. An intra-uterine douche was given. Next day she was transferred to the Fever Hospital. Her temperature was then 104° F., and she looked very ill. She complained of pain in the abdomen. The abdomen was tumid, and there was a firm mass in its lower part, tender on pressure. The edges of the perineum were gangrenous and foul-smelling. The cervix was lacerated and sloughing, and there was also considerable sloughing of the vaginal mucous membrane. The vagina was douched and a large blood-clot brought away. The patient was very restless, and complained of pain in her limbs. Brawny patches of reddened skin were seen over the left internal condyle of the humerus and the extensor surface of the right arm.

She was treated with vaginal irrigation (1 in 40 carbolic), morphia and atropine hypodermically for the pain, and stimulants. Two days later a septic rash appeared on the abdomen, which had become distended. She died that evening. Her temperature ranged between 101° F. and 105° F.

At the post-mortem examination the uterus was found large, the Fallopian tubes and ovaries healthy. There was an extensive pelvic cellulitis which had gone on to suppuration. The placental site was soft and unhealthy-looking. The uterine mucous membrane was ulcerated and broken down at several points. The cervix was much lacerated.

Case V.—*Pelvic Cellulitis, ending in Suppuration—Recovery.*—Mrs. P., a multipara, aged twenty-five, was delivered of a premature still-born child by a midwife. Two days later the temperature rose, and she began to complain of severe pain in the left side of the pelvis. The lochial discharge was fœtid, and there was great tenderness and heat to the left side of the uterus. I washed out the vagina and uterus carefully with perchloride of mercury, and put her on quinine. By next day a distinct mass could be made out in the left fornix, and it soon rose above Poupart's ligament. A few days later rigors commenced, and she had repeated attacks. Her temperature remained high, reaching 105° F. at times. I could not detect any softening in the mass, but from the repeated rigors it was quite evident that there was deep-seated suppuration, and I determined to make an exploratory incision from the vagina. As the friends were anxious for a consultation, she was seen by a consultant, who advised against an exploratory incision. The patient was then removed to one of the infirmaries. Three weeks later she was discharged from there, and two days afterwards a large abscess ruptured into the vagina. The sinus was enlarged and healing soon occurred.

CHAPTER XXXVI

COMPLICATIONS OF THE PUERPERIUM—*Continued*

Septic Cases of Unusual Origin—Fatal Sepsis from a Poisoned Finger—An Old Retro-renal Abscess—An Old Retro-cæcal Abscess—An Old Double Pyosalpinx—A Case of Gonorrhœal Rheumatism—Erysipelas of the Face and Puerperal Septicæmia—Ante-partum Septicæmia—Tetanus—Case.

SEPTIC CASES OF UNUSUAL ORIGIN.

As I have already stated, septic infection generally occurs in some part of the birth canal, but the following cases prove that this is not the invariable rule. I have already detailed a case where the source of infection was undoubtedly a drain, but in that case the infection probably entered the system through the usual channel.

CASE I.—*Fatal Sepsis, originating from a Poisoned Finger.*—The patient, a multipara, aged thirty-five, expected her confinement about the end of November. On November 4, while scrubbing the floor, she ran a large splinter into the middle finger of her right hand. She drew it out and went on with her scrubbing. She paid no attention to the finger until two days later, when it began to pain her. She then applied poultices to it. On the 8th I saw her, and found her suffering from a poisoned finger. It was very tender, and there was some redness along the lymphatics of the arm. The axillary glands were tender. The finger was freely incised, and hot boracic poultices applied. This relieved the local condition. The redness along the lymphatics disappeared, and also the tenderness of the axillary glands. On the morning of the 10th movements ceased, and on the 11th labour came on. A still-born child was delivered at 6 a.m. after a very quick labour. The second stage only lasted about three minutes. Her temperature was then 104·8° F., and the pulse 130. Two hours later the temperature was the same. She was then given quinine and Dover's powder, and by evening the temperature had fallen to 100·6° F. and the pulse to 100. There was now some distention of the abdomen, and sickness had come on. She did not retch, but every now and again mouthfuls of dirty, bile-stained fluid welled up. Evidently regurgitant peristalsis had set in. All efforts to check this, or to get the bowels moved, failed. On the 12th her temperature had again risen to 103° F., and her pulse became very bad. I gave her an injection of antistreptococcic serum, but it did no good. She died about fifty-three hours after delivery. She was quite conscious until near the end, but, a few hours before death, became very violent, and could only be kept in bed with difficulty.

By the time she was delivered, the finger was in a very satisfactory condition. She could bend it without pain. If she had not been pregnant, I think she would have been all right in a few days. The blood condition in pregnancy seems very much to lessen the resistance against septic mischief. That, at least, is my interpretation of the case. If that is true, it is a very strong argument in favour of the most rigid asepsis in midwifery work.

The poison seems to have been fatal to the fœtus. It could not help being seriously affected through the placental circulation, and no doubt its powers to resist such a virulent poison would be very feeble.

Case II.—*An Old Retro-renal Abscess—Fatal.*—The patient, a 10-para, aged thirty-nine, suffered from an incomplete abortion. The uterus was cleared out under chloroform. She had lost a good deal of blood, and was somewhat collapsed. Her temperature was 101° F. on admission, but soon fell, and remained normal until the sixth day, when it rose to 100·2° F., and she was reported to have pus in her urine. At this time there was no tenderness over the uterus, but she complained of pain in the region of the right kidney. She was so stout that nothing definite could be made out by palpation. She stated that she had never had any pain in the kidney region until the abortion.

As the lochia had become offensive I examined her carefully, and discovered a small sinus to the right and behind the cervix. On dilating this, a few ounces of very fœtid pus came away. The sinus led upwards and backwards towards the brim of the pelvis. It was evident there was an abscess cavity above the brim of the pelvis, but, as the patient was now in a very precarious condition, I did not think she could stand a serious operation. The sinus was washed out, and a strip of iodoform gauze inserted, in the hopes that free drainage would occur.

Next day she was very ill and vomited several times. Her temperature was only 101° F., but her pulse was running. There was some distention of the abdomen. The gauze was removed from the sinus and a vaginal douche given. She now began to complain of pain at the base of the left lung, and evidence of pleuro-pneumonia was found. She gradually sank and died next day.

At the post-mortem examination evidence was found of recent and old peritonitis, especially at the right side of the abdomen, and there was a considerable amount of pus free in the lower part. On drawing the bowels up, a large retro-peritoneal abscess was found. The main cavity lay behind the right kidney, but only the upper end of the kidney had been in contact with it. The kidney was healthy. The pus had made its way down retro-peritoneally, behind the cæcum and over the brim of the pelvis near the ureter, and then into the vagina by the side of the cervix. The cæcum and appendix were healthy. Pus had also burrowed up behind the liver and through the diaphragm. The exact point of rupture into the peritoneal cavity could not be ascertained. There was a large mass of old curdy pus in the main cavity. The abscess had evidently been an old tubercular one, but it was not connected in any way with diseased bone. There was nothing to point to what had caused it.

The interior of the uterus was perfectly healthy.

As already stated, the patient had assured us that she had never had any pain in the region of the kidney previous to the abortion, and her husband afterwards told us he had never known her to complain of any. Another remarkable feature was the well-nourished condition of her body. The abdominal wall had about an inch and a half of fat on it.

From the appearance of the parts, the abscess must have been there a long time. The abortion had probably lighted up the action and caused it to burrow in different directions. I cannot say when it burst into the peritoneal cavity, as there was no sudden rise of temperature pointing to this, but I think it burst through the diaphragm the day before she died.

If this abscess had been discovered in time and promptly opened from behind, the patient might have been saved. I hazarded the opinion that there was an abscess behind her kidney when she complained of pain in that region; but as it was impossible to palpate it, and as at that time there was nothing in her condition to justify an exploratory incision, I did not make one. When the sinus opened into the vagina the patient was so ill that I did not think she could stand an operation. As it had probably burst into the peritoneal cavity at the same time, I do not think any good could have resulted then from opening it from behind.

CASE III.—*An Old Retro-cæcal Abscess—Fatal.*—Mrs. C., aged thirty-four, 6-para, was admitted to the Glasgow Maternity Hospital on account of having had repeated hæmorrhages for eleven days. She said that she had menstruated slightly about a month before, and previous to that had been quite regular. For the last month she had noticed that she was rapidly getting stouter. The bleeding of which she complained had occurred at night when she was in bed. The first attack had lasted for nine hours, and had been severe.

She was weak and anæmic. On palpating the abdomen a central abdominal tumour was felt extending upwards for 7½ inches above the pubes. It was 9½ inches across in its widest portion. The tumour was soft and elastic, and did not contract. No fœtal parts could be made out, nor could a fœtal heart be heard, but there was a distinct uterine souffle. A vaginal examination revealed that the cervix was soft, and that the tumour was evidently the enlarged uterus. At the junction of the cervix and body of the uterus a distinct groove could be felt. At the time we could not understand what this meant, but the subsequent post-mortem examination showed that it had been the track of the sinus felt through the mucous membrane of the fornix.

The diagnosis presented considerable difficulty. She was evidently pregnant, but, according to her menstrual history, she had only missed one period, although the one before that had been very scanty, so that at the most she could not be more than two months gone, unless she had been menstruating regularly while pregnant. From the size of the uterus she ought to have been nearly seven months pregnant. I was inclined to think I had to deal with a hydatid mole, but could get no indication of any vesicles having been passed.

She was given small doses of ergot, strychnine, and iron, and kept under observation. On the fourth day after admission there was a slight discharge of blood, and I then determined to dilate the cervix and explore the uterus. On passing the finger into the uterine cavity I found the lower part full of black clot, but I could not reach an ovum. As the cervix was rigid, a Barnes' bag was inserted and left in for some hours. Dilatation was then completed, and the ovum found in the upper part of the cavity attached to the fundus. A four and a half months fœtus was removed, and the placenta and membranes cleared out. The placenta showed no evidence of hæmorrhage. The uterus was washed out, and it contracted well. The anterior wall of the cervical canal was found to have been lacerated, but as the tear did not extend into the vagina, and there was no bleeding, it was not specially treated.

The patient did not seem to suffer from shock, and her pulse was no weaker than it had been. Her temperature was 100° F. at the time of delivery.

She did very well for two days, and then vomiting commenced. Her temperature never rose above 102° F., but she gradually grew weaker and died four days after delivery. There never was any distention of the abdomen, nor were there any indications pointing to septicæmia.

The post-mortem examination revealed that there had been old peritonitis. The caput cæcum was bound down by old adhesions, and, on freeing it and drawing it up, a large old abscess cavity was found. The vermiform appendix was quite free. The cavity was empty. It extended up as high as the crest of the ilium, downwards and inwards over the right side of the bladder, by means of several sinuses. Purulent infiltration of the cellular tissue extended down as far as Poupart's ligament and round the right side of the pelvis. On removing the pelvic contents, and opening up the uterus and cervix, the tear in the anterior wall of the cervix was found to lead into the sinus. The sinus had extended down the cervix, and opened just within the external os by a very small opening. It also appeared to have opened into the upper part of the cervical canal. The internal surface of the uterus was covered with a grayish purulent exudation. No bacteria were found in the blood of the jugular vein on microscopic examination.

The cause of death seemed to have been exhaustion, as there was no evidence of septicæmia. Strictly speaking, this case should not be classed as one of septicæmia, but the presence of the old abscess makes it so similar to the last one that I have coupled the two together.

The discovery of the abscess was a complete surprise to me, as nothing in the patient's history had pointed to its presence. No pus had been discharged during her stay in hospital, neither did she tell us of ever having had any discharge except of profuse "whites" six months after her third confinement, when she had suffered from "inflammation of the womb," but that was years before. One can hardly imagine that the abscess could have formed then, as her fourth and fifth confinements had been quite normal. It is curious that so large an abscess could have discharged itself without the patient's knowledge. The opening was very small, and, as it was within the external os, the pus would tend to ooze away slowly. The position of the opening accounts for our not seeing it when the cervix was being dilated. The reason why the anterior wall of the cervix had torn was made plain at the post-mortem examination. The thin partition between the cervical canal and the sinus had given way.

A careful examination of the tear would have led to the discovery of the sinus during life, but nothing would have been gained, as no operation would have been of any avail.

The reason why no hæmorrhage occurred during the day, while the patient was up, was, I think, due to the fact that the sinus so weakened the cervical wall at its upper part that the weight of the uterus caused an acute bend at the junction of the body and cervix, and thus closed the cervical canal.*

I have seen two other cases of old pelvic abscesses in the hospital, in the practice of colleagues, within recent years. The condition, therefore, cannot be termed exceedingly rare. In two of these four cases there was absolutely no evidence of the presence of an abscess, and in none of the cases was there any history obtained pointing to such a serious complication.

CASE IV.—*An Old Double Pyo-salpinx—Fatal.*—Mrs. McN., aged twenty, 2-para, was delivered by forceps, as the second stage was somewhat prolonged. The first and second stages of labour had lasted twenty-four hours. The perineum was partially torn, and required three sutures. The child was alive, and weighed 7½ pounds.

The patient showed an unusual amount of pigmentation of the face. A number of copper-coloured scars were noticed about the buttocks, and she gave a history of having had ulcers two years before. Syphilis was strongly suspected.

On the third day of the puerperium the temperature, which had until then been normal, rose to 101° F., and the pulse to 130. On the fourth day the temperature rose to 102° F. An intra-uterine douche was given, but everything seemed perfectly sweet. Quinine was given, and the temperature fell to 100° F. next morning, but rose to 102° F. in the evening. Another douche was given, but the uterus seemed perfectly healthy. The abdomen was now distended and painful, and as there had been persistent diarrhœa for three days we suspected enteric fever. There were no rose spots, enlargement of the spleen, or epistaxis. The blood gave a doubtful Widal reaction. A second specimen, taken two days later, gave a decided negative reaction. The severe diarrhœa persisted. The temperature varied between 100° F. and 102·6° F., and the pulse from 100 to 130. The pulse grew gradually weaker in spite of free stimulation, and the patient died on the ninth day of the puerperium. Just before death the temperature rose to 104° F.

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* Cases of concealed accidental hæmorrhage in the early months of pregnancy are rare, but I have seen three others. In all of them the uterus was fully double the size it ought to have been. In one only was there a history of an injury. I was able to definitely diagnose the last two before exploring the uterus.

The cause of death had evidently been septic peritonitis. I felt pretty confident that the source of infection would not be found in the vagina or uterus. The lochia had remained sweet, and the perineum had healed. No pelvic swelling could be made out *per vaginam*, and the distention of the abdomen prevented one from making out anything bimanually. By means of the post-mortem examination, I was enabled to verify my opinion.

The abdomen was much distended and somewhat discoloured. On opening it a quantity of thick, opaque, sanguineous fluid escaped, carrying numerous flakes of curdy pus with it. This came from the lower part of the abdomen, chiefly from the right side. A considerable amount was removed and the parts were examined. The appendix was found fairly healthy, save for some old adhesions; the bowels generally were distended, injected, and slightly glued together. The right Fallopian tube was swollen, injected, and a quantity of purulent necrotic material was found at the ostium. The ovary was soft and gelatinous, and came away easily; it seemed to have formed the posterior wall of a large pyo-salpinx. The left tube and ovary were in exactly the same state. The interior of the uterus was perfectly healthy in appearance.

There is no doubt that this was a case of old double pyo-salpinx. The abscesses were certainly not of recent origin. If they were both present before impregnation, the question is how did the ovum find its way into the uterus. The ovaries were so destroyed that it was impossible to decide from which the ovum had come. The tube of that ovary, at least, must have been free of pus to allow of the ovum passing.

If we had been able to exclude enteric fever when the serum was first examined, I would have opened the abdomen, and might possibly have saved the patient, but by the time a decided negative Widal reaction was got the patient was moribund.

A short time previous I had seen an almost identical case in consultation in the country. The child had been born before the doctor's arrival, and there had been no vaginal examination. Profuse diarrhœa set in, with a rise of temperature. There was no palpable tumour, but there was some tenderness at the side of the uterus. I at once suggested to the doctor that I thought the source of infection was from the tube, and he then told me that he had treated the husband for gonorrhœa two years before. The Widal reaction was negative. She improved for a little, but died about ten days later. If she had been in a place where an operation was feasible I would have opened the abdomen. There was no post-mortem examination, but in the light of the second case I am firmly convinced that my diagnosis was correct.

CASE V.—*A Case of Gonorrhœal Rheumatism—Fatal.*—Mrs. C., aged thirty-one, 4-para, eight months pregnant. For the past three years this patient had suffered from extreme nervousness and occasional attacks of *petit mal*, following on the sudden death of her two children from malignant measles. Her third confinement had been quite normal. During the present pregnancy she had suffered a good deal from nervousness, but her health had otherwise been fairly good.

On June 23 she was going about as usual, until about 10 p.m., when she was seized with severe pain in the right knee and heel when going upstairs. When I saw her at 11.30 p.m. she was screaming with the pain. There was no swelling of the parts, but a point to the inner and outer side of the knee was excessively tender. Her pulse was 120, and temperature 99° F. She was given ¼ grain morphia hypodermically, and 15 grains sodium salicyl every four hours, and hot fomentations were applied. Anodyne applications and blisters to the knee were tried afterwards, but large doses of morphia alone relieved the pain.

On the eighth day after the seizure labour came on. By this time there was some swelling of the knee, but nothing marked. As yet her temperature had never risen above 100° F. I delivered her with forceps of a live female child, and while she was under chloroform I punctured the knee-joint with a hypodermic, and got a little sero-pus from the inner side. A few hours later I opened the joint freely and collected some of the fluid in sterilized tubes. There was very little pus in the fluid. A large drainage-tube was passed through the joint. In the evening her temperature rose to nearly 104° F., and her pulse to 140.

On the third day after delivery a punctate rash developed over both wrists, and she began to complain of severe pain in the right one. She had now become quite maniacal, and for twenty-four hours was kept in bed with difficulty. There was no distention of the abdomen nor pain over the uterus, and the lochia remained sweet. The temperature fell to normal on the fourth day, but soon rose again. The patient died on the sixth day after delivery. She had been treated with large doses of quinine and morphia twice a day, but nothing seemed to do her any good.

At first I was inclined to look upon the case as one of hysteria, knowing the nervous state of the patient, but I very soon came to the conclusion that I had to deal with rheumatism of a gonorrhœal origin, and this diagnosis was confirmed, as the child developed typical ophthalmia in one eye on the third day of its life. Pus from the eye showed diplococci, evidently gonococci. An examination of the fluid from the knee-joint revealed staphylococci, but no strepto- or gonococci. Undoubtedly there was mixed infection in this case. The child survived, and it afterwards developed congenital syphilis, so that the infection was a very mixed one. This patient had never shown any indications of venereal disease, and all her former children had been quite free from any taint, so she must have been infected subsequently to her third confinement.

Case VI.—*Erysipelas of Face and Puerperal Septicæmia—Recovery.*—I was asked by a sanitary officer to see a primipara, aged thirty-three, suffering from erysipelas of the face, in order to decide whether or not she should be removed to the erysipelas wards of the fever hospital. I found that she was in labour. The os was the size of a florin and the membranes were ruptured. The pelvis was contracted (flat rickety), with a diagonal conjugate of barely 4 inches. I did not consider it advisable to remove her to an erysipelas ward.

When the os was dilated more fully some hours later, she was delivered with forceps with difficulty. The child could not be resuscitated. The perineum was slightly torn, and required two stitches. Next day she was very well, with a normal temperature, and pulse of 112. The face was still much swollen. On the third day of the puerperium the temperature rose to 101° F., and the pulse to 120. The uterus was douched out with corrosive sublimate. The lochia had now become foul, the abdomen was becoming distended, and there was some diarrhœa. Next day she was worse, so I notified the case as one of puerperal sepsis, and ordered her removal to the fever hospital.

Six days later I was asked to see the woman to take the stitches out of the perineum, and I then learned that she had refused to go to the fever hospital. I found that she had had profuse diarrhœa all that time, and it was still present. She was very weak, but the abdominal tenderness had disappeared, and the temperature fallen to nearly normal. She had had no treatment but copious supplies of whisky. I took the stitches out of the perineum, and found it had not healed. The lochia were very fœtid. The erysipelas had disappeared from the face. A few days later she was removed to the fever hospital, where she ultimately recovered, and has since been delivered of another child in the Maternity Hospital.

That she recovered has always seemed to me a marvel, considering the filthy house she was in, and that she lay for a week without any treatment. The uterus was no doubt infected by the erysipelas.

In this connection I may refer to a case of septicæmia, where the infection was conveyed to the patient by a nurse who had just come from attending a case which had erysipelas. The nurse was not to blame, as she was unaware of her first patient having erysipelas. The second one developed violent septicæmia, from which she died a few days later.

I need hardly say that if one is unfortunate enough to have to deal with a case of erysipelas one cannot be too careful in sterilizing one's hands, etc., before attending a confinement case. In fact, a practitioner who is attending much erysipelas should not do midwifery.

Case VII.—*Ante-partum Septicæmia.*—It is seldom one sees a case of acute septicæmia before delivery, where the infection has probably been conveyed into the system through the genital canal. The following case, I believe, was of this nature:

J. S., aged twenty-two, 1-para, was brought into the hospital moribund. She had been in labour for five days under the care of an old woman, who had not seen anything in the condition of the patient to alarm her. A neighbour, however, had insisted on calling in a doctor, who at once ordered the removal of the patient to the Maternity Hospital.

On admission the patient was cold and pulseless, but her mind was quite clear. Her lips and tongue were black, and there were livid patches on her face and body. There was a horrible cadaveric odour from her. On placing the hand on the abdomen distinct friction could be felt. The vagina was in a frightfully septic condition, and the stench from it, especially during and after delivery, was overpowering. The pelvis was slightly contracted. The head was perforated and delivery easily effected. The fœtus was putrid. There was no bleeding, but the uterus remained quite uncontracted. On passing my hand in I found the placenta was adherent. The uterus felt like a collapsed football. As I peeled the placenta off, the uterus tended to invert. There was no bleeding. A large saline injection was given under the patient's breast and hypodermics of strychnine, but she died in a few minutes. We did not get a post-mortem examination, as we were only too glad to get the body out of the hospital as quickly as possible.

The dirty fingers of the old woman had, I think, infected the patient some days previous to admission.

CASE VIII.—*Septic Peritonitis arising from an Old Ulcer of the Stomach and a Sub-hepatic Abscess.*—Mrs. McA., aged twenty-nine years, 5-para, was admitted to the Glasgow Maternity Hospital on May 27, 1903. Her previous obstetric history was a rather striking one. In February, 1899, she was brought to the hospital by her medical attendant after he had failed to deliver her of her first child. Her pelvis was found to be of the flat, rickety type, with a true conjugate of 3½ inches. Dr. Black delivered her with forceps. The child was dead. Her puerperium was febrile, and she had a good deal of albumin in her urine. In 1900 she was again in hospital, under my care, and had a spontaneous, premature labour at the seventh month. The child lived ten days. In 1901 she was delivered at home at full time. The child was born by the breech, and was dead. In 1902 she was again delivered at home prematurely. The labour was spontaneous, and the child came by the breech, but was dead. Early in the present pregnancy (her fifth) she wished to engage me to induce labour for her at her own home, but I advised her to wait to full time and come into hospital and have symphysiotomy done. When she was about eight months pregnant she came to hospital in labour, and was at once admitted. The presentation was a footling one. The delivery was easy, as the after-coming head was easily pushed through the pelvis by supra-pubic pressure. The child, a male, was alive, and weighed 5 pounds.

The patient was very well for two days, but on the morning of the third day her temperature rose to 101·2° F., and her pulse to 120. Next day it rose to 104·6° F., and her pulse to 136. On the morning of the fifth day it fell to 99° F., and her pulse to 112, but in the evening it again rose to 103·6° F., but came down to 99·8° F. on the sixth day, some hours before she died. When her temperature rose she began to complain of pain, chiefly in the upper zone of the abdomen. The uterus was large, but not tender to pressure, and the lochia were sweet. There was some distention, and on palpating the abdomen she complained of pain in the upper region. On the fourth day she was sick, and vomited a good deal, but there was nothing in the vomited material characteristic of a gastric ulcer. Her urine contained a few pus corpuscles, but was otherwise normal. I gave her an intra-uterine douche, but nothing was washed out of the uterus. Curiously enough, the temperature fell steadily for twelve hours after the douching, until it reached 99° F. The distention and tenderness of the abdomen also lessened, and the patient seemed much better. Early on the sixth day she became very restless and delirious, and in a short time quite maniacal, and could only be quieted by ¼ grain of morphia hypodermically. She died in the afternoon.

The following is Dr. Carstairs Douglas's report of the post-mortem examination :

" *Thorax.*—Much encroached upon by the liver, which had pushed the diaphragm up to rather above the fourth rib. Neither pleural sacs contained any fluid ; both lungs were slightly œdematous and showed a little passive engorgement ; no consolidation in either ; both were emphysematous along the outer margins and at the apices. The heart appeared to be healthy.

" *Abdomen.*—Immediately on opening the abdomen a large quantity of sanious fluid welled up from under and behind the liver, carrying with it thick, curdy flakes of pus. Examination showed a purulent exudation above and over the liver, and extending down the colon as far as the pelvis ; the colon (ascending and transverse) showed much hyperæmia and inflammatory mottling, and the same was noticed on the peritoneum over the stomach. This was apparently recent. The upper surface showed some adhesions to the diaphragm, and below it, close to the transverse fissure, were adhesions between the liver and the stomach, enclosing an abscess cavity, from which thick, curdy pus welled out. The stomach wall here was very thin and gelatinous, and there was a communication with the cavity. Internally the stomach wall was markedly hyperæmic at the point of adhesion and around.

" The kidneys and spleen were healthy. There were signs of peritonitis over the coils of small bowels. The appendix was healthy. The right ovary was cystic, and the uterus healthy.

" It would appear that there had been adhesions between the liver and the lower curvature of the stomach, near the pylorus, and the perforation that eventually took place had led to the formation of a sub-hepatic abscess, but not to general peritonitis. The strain of delivery probably ruptured the adhesions, and set up a more widespread purulent peritonitis."

The strain of labour probably ruptured some of the adhesions, but I do not think the abscess cavity was then opened into, as the patient's pulse and temperature remained normal for two days after delivery. If the pus had got into the peritoneal cavity at the time of delivery there would have been indications of this almost immediately. I am inclined to think that the lessening of the inter-abdominal pressure by the emptying of the uterus allowed of the pus burrowing its way out in a couple of days. If any of the adhesions had broken down, the process would have been assisted. This, however, is of small consequence.

On subsequently questioning the husband, we learned that for a year or two back the patient had had pains in the epigastrium after taking food, and had vomited at times. Towards the end of the present pregnancy these symptoms had become worse, and the patient had occasionally vomited blood, but never any quantity. Her vomit in the hospital never contained any blood. Even with this information I do not think I could have diagnosed the condition, and if I had, an operation would have done no good.

The case is an extremely interesting one, and bears out the importance of having a post-mortem examination. It also shows that an obstetrician must never forget that there are many other organs in the body besides the uterus, and that he must not concentrate his attention upon it alone when anything goes wrong with his patient. I was quite convinced that the interior of the uterus was healthy, but I could not make out the source of infection.

Tetanus.—This is a very rare complication of the puerperium, and, when it does occur, it is likely to be fatal. The disease is due to infection from the tetanus bacillus, which may gain entrance to the system through the birth-canal in dust-laden air, or more probably through the medium of unclean fingers or instruments. The infection may also gain entrance through a wound in any part of the body.

The symptoms are exactly the same as in an ordinary case of tetanus. They may begin to manifest themselves any time during the puerperium, but not usually later than the second week. At first there may be merely a certain amount of stiffness about the jaws and neck, but this soon becomes more marked, and the other muscles of the body become affected. The disease may run its course, usually to a fatal issue, within a few days, but it may last much longer. The fever may be high throughout, or just before death, but in some cases it may be quite moderate, or entirely wanting. In some cases there is a mixed infection, and then the fever may be high, irrespective of the tetanus.

Diagnosis.—Rigidity of the jaws and retraction of the head are usually the earliest indications. When the trunk muscles are affected the condition cannot be mistaken, but occasionally, in the early stages, it has been mistaken for hysteria.

Prognosis.—It is exceedingly dangerous. About 90 per cent. of the patients die. This is much the same as in surgical cases, so the puerperal condition does not seem to influence one way or the other.

Treatment.—The uterus and vagina should be very thoroughly disinfected with perchloride of mercury douches. Chloral and bromide should be given in large doses, or the antitetanic serum used. In the only case which I have seen the latter was used freely, but it seemed to make matters worse. Hirst mentions a similar experience. The patient should be very freely stimulated.

CASE.—Mrs. K., aged twenty, primipara. Patient had been in labour for twenty-four hours, under the care of a midwife and a doctor. The latter had attempted to deliver with forceps without $CHCl_3$. On examination, the abdomen was found to be pendulous, the bladder somewhat distended, but no Bandl's ring. The os was dilated. Patient had no pains. There was considerable œdema of the vulva and bruising of the vagina, and the cervix had also been torn. The conjugata vera was made out to be 3¾ inches. As no fœtal heart sounds could be heard, craniotomy was done. The child, minus the brain, weighed 8 pounds. There was some albumin in the urine. Patient's progress was at first very satisfactory, although the temperature was somewhat raised. An intra-uterine douche was given on several occasions, but nothing abnormal came from the uterus. But seven days after delivery she began to complain of stiffness in the muscles of the jaw. Next morning she was unable to open her mouth, and she made great complaint of pain and stiffness in the muscles of the jaw and neck. By mid-day the head was retracted, and both eyebrows raised. She was unable to swallow. She complained of acute pain in the back of the neck and sterno-mastoids. In the afternoon she was worse, restless and fretful, and the head was more markedly retracted.

Seventy c.c. of Pasteur's antitetanic serum were injected into the right flank in two separate doses. Patient slept thereafter, with short intervals of wakefulness, and complained on wakening of severe pain in the back of the neck.

At 1.15 a.m. on the ninth day she had a severe respiratory spasm, affecting chiefly the muscles of the larynx. The movements of respiration kept up, but almost no air entered the lungs. She recovered from this in fifteen minutes, but ten minutes later had another spasm, so severe that she became asphyxiated. Movements of respiration ceased, she became relaxed, pupils dilated, and the pulse was almost imperceptible. Artificial respiration was performed for a few minutes, when she began to breathe again naturally. She had numerous further spasms, which were relieved by chloroform inhalations, but she became gradually more and more exhausted, the head becoming more extremely retracted. She died cyanosed at 1.10 p.m. Respirations ceased before the heart stopped beating. She had in all twelve spasms, which latterly affected the muscles of the back as far as the lumbar region. Throughout the attack there was no rigidity of the abdominal muscles.

No post-mortem examination could be obtained.

The infection had undoubtedly been conveyed to this patient before her admission to hospital. She had a partially cicatrized wound on one of her hands, and it is just possible that this was the seat of infection. The serum seemed to aggravate her condition.

CHAPTER XXXVII

COMPLICATIONS OF THE PUERPERIUM—*Continued*

Diseases of the Cardio-vascular System—Syncope—Shock—Embolism—Cases—Phlebitis—Phlegmasia Alba Dolens—Cases—Mammary Complications—Galactocele—Complications of the Nervous System—Paralysis—Eclampsia and Chorea—Insanity.

DISEASES OF THE CARDIO-VASCULAR SYSTEM.

THE subject of cardiac disease has been already so fully treated in dealing with pregnancy and labour that very little need be added. Cardiac disease seldom arises during the puerperium, except in connection with sepsis, as an acute pericarditis, or malignant endocarditis, which inevitably terminates fatally. In the majority of cases of cardiac disease, if the patient passes safely through the strain of labour, she will recover, but death may occur from cardiac failure within a few hours of the end of labour (see Case VI., p. 316).

Syncope.—This is common after severe hæmorrhage, but it occasionally arises in cases where there has been no hæmorrhage, and where the heart is apparently healthy, as no murmurs can be detected. The heart is probably fatty and dilated, especially on its right side. The patient suddenly collapses after delivery, and shows all the indications of severe shock. She may die if prompt measures are not adopted to stimulate her.

The two following cases occurred in the hospital within a day or two of each other. The first, an unmarried primipara, was delivered by natural efforts after a labour of a few hours. The placenta and membranes were adherent, and were removed under chloroform. There was no post-partum hæmorrhage, and yet, when the patient came out of the chloroform, she exhibited such profound collapse that she looked as if she were dying. Her pulse became almost imperceptible. She was freely stimulated by strychnine hypodermically, and whisky by the mouth, and was surrounded with hot-water bottles.

For several days her pulse remained very rapid and feeble, but she made a good recovery.

In the second case there was a slight amount of post-partum hæmorrhage, but not sufficient to account for the alarming prostration which came on after an easy labour. It looked as if there had been an internal hæmorrhage from a ruptured varicose vein in the broad ligament. The patient was freely stimulated and given a saline injection, and she gradually rallied, but the pulse was very feeble for some time. A careful examination failed to reveal any evidence of an internal hæmorrhage, either into the peritoneal cavity or the broad ligament.

Shock.—After severe or prolonged labours there is generally a considerable amount of collapse from shock.

This should be treated by warmth and free stimulation. Strychnine is by far the best stimulant in these cases, and it should be given freely hypodermically. Saline infusions of one or more pints are also most useful.

Embolism.—Embolism of the lung may arise any time during the puerperium, but it sometimes happens at the time of labour. It is liable to occur in cases of thrombosis of the veins of the legs, as in phlegmasia alba dolens, but it may occur in a case where the puerperium is apparently following a normal course. In the latter instance the clot seems to come from one of the uterine sinuses, or from one of the veins in the broad ligament. In my Cæsarian section cases I have always been struck by the almost invariable varicosity of the veins of the broad ligament. Clotting must often occur in them, and it is easy to understand how a bit of one of these clots may readily be detached. The entrance of air into the circulation will cause much the same condition.

Signs and Symptoms.—The patient, who may have been feeling quite well, is suddenly seized with dyspnœa and a feeling of impending death by suffocation. She will sit up in bed and throw the clothes off in her endeavours to gain breath. The attack will probably prove fatal in a few minutes, before anything can be done to relieve her. If she does not die in a few minutes there will be some hope of saving her.

Treatment.—If a patient suffers from thrombosis in any of her veins she should be warned to keep at rest, and massaging the limbs should not be allowed. When embolism happens, the patient should at once be propped up in bed and given stimulant as freely as possible, in the form of sal volatile, whisky, or brandy. If oxygen were at hand it could be used, and would probably do good. If the patient survives the first onset she should be kept perfectly quiet, and be treated with large doses of carbonate of ammonia, perhaps combined with iodide later on, to cause absorption.

CASE I.—A multipara, with a very rigid cervix, began to show indications of exhaustion, after being in labour for a considerable time. The membranes had ruptured early. Under chloroform, I dilated the cervix manually, and delivered with forceps. There was a free post-partum hæmorrhage, which was checked by an intra-uterine douche. The patient began to complain of difficulty of breathing, and said she felt as if her chest was encircled by an iron band. Her pulse became very rapid and weak, and I thought she was dying. She was lying on her left side, and she begged me to turn her on to her right side. I did so, and as her head touched the pillow she gave a very deep inspiration, and said at once, "I am all right." She breathed quite naturally after that, and had no further trouble. I never could find any indication of an infarction in the lung afterwards. This may not have been a case of embolism, but clinically the symptoms were identical. If there was an embolus, I do not know what became of it afterwards. The condition may possibly have been caused by the entrance of air into the circulation. The change in her condition was very marvellous and sudden. The gasping, struggling breathing ended in one long inspiration and feeling of instantaneous relief.

CASE II.—A multipara, delivered in connection with the outdoor department of the Maternity Hospital, suffered from phlebitis in one of her legs. There was no phlegmasia, but there was slight thrombosis. She was ordered to keep her bed, and did so. On the twenty-second day of the puerperium, while lying in bed, she suddenly sat up, threw the clothes off, gasped for breath, and died in a few minutes. By the time I reached the house she was dead. A piece of clot had undoubtedly separated and passed on into the lung. She was lying in bed at the time, but had very probably been moving her legs, and thus caused the separation of the clot.

CASE III.—Mrs. D., 6-para, aged thirty-three, was admitted to the Glasgow Maternity Hospital on November 24, 1900, complaining of frequent and profuse flooding. She had had an abortion about four months before. She was again about two months pregnant, and had lately had profuse bleedings. She was very nervous, and evidently suffering from alcoholism. The uterus was enlarged, but the os was undilated. There was very little bleeding. The vagina was well douched and plugged. The plugging was repeated next day. After the second plug was removed, she was given chloroform in order to clear out the uterus. Hegar's dilators were used, as the os was only partly dilated. Before the uterus could be cleared with the flushing curette, she stopped breathing, and artificial respiration had to be performed for some time. The operation was discontinued, and as there was much oozing from the uterus, the cavity was plugged with iodoform gauze. She was freely stimulated by enemata; and hypodermic injections of ether and strychnine, and a large saline injection were given. Next day 1½ pints of saline infusion were given into the abdominal wall, as she was very weak, and her urine was scanty.

As she was so weak, no attempt was made to clear out the uterus. The ovum came away on the 29th, but there was still some decidua left.

On the 30th, about 3.15 a.m., she awoke in a very breathless condition, and died in a few minutes.

At the post-mortem examination a large ante-mortem clot was found in the right ventricle. It was adherent to the endocardium and musculi papillares, and extended right up into the pulmonary artery. The heart was dilated and fatty. No trace of an infarction could be found in the lungs, but the elongated clot had completely blocked the artery, even extending into the two branches.

The presence of this large ante-mortem clot was very interesting, in view of the fact that superficially there was a marked diminution in the coagulability of the blood. Her tongue had bled for several hours, from a slight puncture made by forceps in keeping it forwards. There were also hæmorrhages into the subcutaneous tissues at the several hypodermic punctures, and at the points of infusion. It looked almost as if she were suffering from a mild form of hæmophilia.

CASE IV.—See Eclampsia, Case XXI., p. 348.

Phlebitis.—Inflammation of the veins of the legs is not very uncommon. It is usually associated with varicosity. The patient complains of pain in the calf of the leg or behind the knee. Some redness will be seen, and the part will be tender. If there is much inflammation, thrombosis will occur, and if the lymphatics become involved, the whole limb will become swollen and tense, and the condition of phlegmasia alba dolens will arise. The clots may suppurate.

Treatment.—The patient must be kept quiet in bed, and have local sedative applications, such as lead and opium, belladonna, etc. If there is any clotting, the part must not be moved or handled much, for fear of detaching a piece of clot. If suppuration occurs, free incisions must be made.

CASE. — *Phlebitis with Thrombosis and Suppuration.* — J. S., 2-para, aged thirty-three, full time, natural delivery. The perineum was slightly torn, and required two stitches. On the third day of the puerperium the temperature rose to 102·6° F. in the evening, but fell to nearly normal next morning. For the next ten days there was an evening rise to nearly 102° F. The lochial discharge was fœtid. The case was one of sapræmia, and was treated by douching. On the sixth day of the puerperium the veins in the popliteal space and calf of the left leg were found to be inflamed and blocked with clot. There was no swelling of the leg. Glycerine and belladonna was applied. and the leg wrapped in wool and elevated. On the sixteenth day of the puerperium, pus was detected in the clots. The temperature had been normal for about four days. Five incisions were made, the pus and necrotic tissue cleared out, and the wounds stuffed with iodoform gauze. In a fortnight the wounds had healed, and the patient was dismissed well.

Phlegmasia Alba Dolens.—In this condition, in addition to phlebitis and thrombosis of the veins of the legs, the lymphatics are involved. The affected part becomes enormously swollen and brawny. It is so tense that it pits only slightly on pressure. The left leg is the one most frequently attacked. Both legs may be involved, but it usually begins in one first, and spreads to the second some days later. The leg below the knee may be involved alone, but it usually attacks the thigh as well, and may extend on to the abdomen.

Time of Onset.—It is exceedingly rare before delivery. The usual time of onset is in the second or third week of the puerperium, but it may be even later.

Cause.—Various theories have been advanced, but to my mind it seems clear that the condition is due to sepsis. Undoubtedly there are predisposing causes, such as the blood condition, exhaustion from severe labour, and hæmorrhages; but these latter conditions predispose to septic absorption. The left leg is the one usually attacked, because the left side of the cervix is the more frequently lacerated, and through that laceration the absorption takes place. Pelvic cellulitis is nothing more or less than phlegmasia of the broad ligament, and it is invariably septic in origin. Whether or not the organisms which cause the condition are identical I cannot say, but I should think they are. It seems to me that if the absorption is not very great, pelvic cellulitis results, while if it be considerable, phlegmasia alba dolens, or general sepsis, or both, may arise. Long ago Tyler Smith wrote: "I believe that contagion and infection play a very important part in the production of the disease. I look on a woman attacked with phlegmasia dolens as having made a fortunate escape from the greater dangers of profuse phlebitis or puerperal fever." The peculiar swollen condition of the limb is due to involvement of the lymphatics. In elephantiasis, and also in cases of cancer, we have an analogous condition so far as the swelling goes. The veins are inflamed and blocked, but this does not cause the brawny swelling, as you may have a complete thrombosis of the veins of the leg without any swelling (see Case II.).

Signs and Symptoms.—The patient is usually first seized with severe pain in the calf of the leg. Her temperature rises, and she may have a rigor. At first there is very little swelling, but there is great tenderness, and the vein or veins may feel hard as if thrombosed. There may be some redness over them, especially if they are superficial. In a day or so the leg will begin to swell and become brawny and difficult to pit. It will be white and glazed. To the patient it will feel heavy and dead. The swelling may be confined to the leg below the knee, or it may extend all the way up the thigh, and even on to the lower part of the abdomen. In a week or so the other leg may be attacked. In a few days the constitutional disturbances will disappear; but if suppuration begins the temperature will again rise, and there may be a recurrence of rigors. If suppuration does not occur the swelling will gradually subside, and in six weeks or so the leg will have returned to nearly its normal size, but it will remain weak, and very liable to swell, when the patient is on her feet for any length of time. Throughout the remainder of her life the patient will suffer more or less from this.

Diagnosis.—The swollen, brawny condition of the leg cannot be mistaken for anything else.

Prognosis.—Most cases recover, but there is usually some weakness of the leg left behind. One must always bear in mind the grave risk of sudden death from detachment of a piece of clot, and take steps to guard against this.

Treatment.—In the acute stage the pain must be combated with opiates and sedative applications to the leg, such as lead and opium, laudanum, belladonna and glycerine, etc., with hot fomentations. The entire leg should be rolled in wool. For the fever give quinine. As a rule, free stimulation will be necessary. In the later stages perfect rest must still be enforced; bandages to the limbs should be carefully applied, and, when the danger of detaching a piece of clot is past, massage should be employed. Absorbent liniments, such as lin. pot.

iodi. c̄. sapone may be used. When suppuration occurs, free incision and drainage must be carried out. The freer the incisions are, the quicker will be the healing. When the patient is allowed to get up she should wear an elastic bandage or stocking for some time.

The following two cases may be taken as illustrative. The first one was comparatively mild, while the second was exceedingly grave :

Case I.—Primipara, aged thirty-nine ; presentation L.O.A. ; labour lasted seven hours. As the perineum was rigid, delaying the head at the outlet, I applied forceps and delivered a live female child. The perineum was intact. I need not occupy space with full notes of the puerperium, but shall give the facts which are of importance. On the third day her temperature rose to 103° F., and she became very ill with puerperal fever. I felt sure I had not infected her, as I had not been dealing with any septic cases for some time, and I knew my forceps were clean. I soon noticed her temperature was usually 104° F. in the mornings, and that it fell during the day from two to three degrees. Her bed was in the kitchen, and the sink was within a few feet of the foot. I suspected this was the source of infection, and she told me she had frequently found a bad odour coming from this sink. During the day the house was well ventilated, and the sink was also being continually flushed, so that very little sewer-gas would escape into the room, and if it did, it would be carried off in the ventilation. During the night, however, a very different condition of affairs existed. When the house was closed and warm and no water running, then sewer-gas would be sure to escape into the room if the traps were imperfect. To test this theory, I had a plug put into the outlet, and then filled the sink with strong perchloride of mercury solution, and, as I fully expected, the temperature did not rise. When the sink was left open another night the temperature rose again. The sanitary inspector told me the trap was too shallow, and he had no doubt gas could escape. No arrangements could be made to remove the patient. She was treated in the usual way, with opium for the pain, quinine for the fever, and large doses of perchloride of iron to combat the septic condition. She was also freely stimulated. I douched out the uterus with 1 to 2,000 perchloride of mercury, in all eight times. There never was the slightest indication of mercurial absorption, but I took my usual precaution of ending the douche with pure water. By the end of the ninth day the temperature had fallen to normal. It afterwards rose on two occasions to 104° F., but an intra-uterine douche speedily brought it down. On the eighteenth day she began to complain of pain in the calf of the left leg, and her temperature rose again for a few days to about 101° F. She had been troubled with inflamed veins in the thigh of that leg during pregnancy. The leg became swollen and tender to touch, up to the knee. Fomentations, and belladonna and glycerine were applied, and it was rolled in cotton-wool, and opium was given. The pain continued for a week, and then abated. The leg below the knee now presented the typical white, brawny appearance, and was double the size of the other. The thigh was very little affected. After that it ran the usual course, and the leg gradually decreased in size, until in six weeks' time she was able to be up a little. Since then she has had to wear an elastic bandage, as the leg swells when she is much on her feet.

She was confined three years later in the same house, and made a perfectly normal recovery. A new trap had been put in, so there was no escape of sewer-gas.

Case II. was a much more serious one. She was also a primipara, aged twenty-six; confined December 14, 1895. She has a contracted pelvis, with the following measurements: Intercristal diameter, 11¼ inches; interspinous, 10¼ inches; external conjugate, 7 inches; diagonal, about 4 inches; true, barely 3½ inches. The face presented with the chin to the left side, and was lying free above the brim in the transverse. Dr. Murray Cairns kindly gave chloroform. I failed to rectify by bringing the occiput down, so I turned. Suprapubic pressure and traction got the head through without very much delay, but we could not resuscitate the child. The chest was enormously developed, and this had evidently contributed to the face presentation, and had also prevented rectification, as it interfered with flexion. The perineum was not torn. An intra-uterine douche was given. For ten days the puerperium was normal, with no particular rise of temperature. On December 24, the eleventh day, she began to complain of pain below and to the inner side of the left knee. She had several rigors, and her temperature and pulse rose. Two days later the temperature was 104° F., and the pulse 120. The leg now began to swell, and the pain was excessive. Ten days after the seizure the pain lessened. The leg was now enormously swollen throughout its whole extent; the left labium majus and the abdominal wall of the same side were also swollen, and there was hardness above Poupart's ligament. The parts presented the typical white, brawny appearance. She was now seized with severe pain, first in the buttock, and then to the inside, and behind the knee, of the right leg. The right leg did not swell, but in a day or two the long saphenous vein, from below the knee up to within a few inches of Poupart's ligament, was completely blocked with clot. The short saphenous vein was also blocked in its upper part. For about 8 inches along the inside of this knee and up the thigh there was a band of redness over the long saphenous. During this time she was very weak, and her temperature kept from 101° to 102° F. She began to cough a good deal, and her breathing was very laboured. It looked as if the pulmonary circulation were becoming embarrassed. Râles could be heard over the front of the chest, but I did not risk raising her to examine the back of the lungs. In a few days the pain in this leg decreased, the temperature fell, and the breathing became freer. She was now unable to move either leg, but lay with them flexed at the knees and supported on pillows. She mentioned that every time she took a drink she felt a sensation in the legs, as if the blood were forcing its way along the veins. The treatment had consisted of the free use of morphia for the pain, quinine for the fever, and painting of the painful parts with belladonna and glycerine. She was freely stimulated with whisky, and the legs were kept enveloped in wool. In spite of frequent orders to the contrary, her attendant allowed her to get wet, and two small bedsores formed on the buttocks. I had her placed on an air-bed, and these sores did not give any trouble. I superintended the moving of her on to the air-bed to prevent any rough handling, for fear of detaching a bit of clot. Fortunately, she escaped this serious accident. Flannel rollers were put on the legs.

On January 25, 1896, a month after the seizure, the left leg had decreased considerably in size ; but I found abscesses had formed in two places inside and below the knee, where she had first felt the pain. These were freely opened and stuffed with iodoform gauze.

On February 4 a large abscess had formed in the back of the thigh of the same leg. This was also freely opened. Just below Poupart's ligament of the same leg another abscess was beginning to form, and the clots in the veins of the right leg were beginning to break down.

On February 11 Dr. G. Balfour Marshall kindly gave chloroform, and I laid the long saphenous vein of the right leg open from the inside of the knee for fully 6 inches up the thigh. I also made a free incision into the upper part of the short saphenous, and two more, lower down in the calf. The necrotic tissue was scraped out, and the cavities stuffed with iodoform gauze. In the left leg I made a free incision below Poupart's ligament, and drew a tube down the course of the femoral vein along Hunter's canal, to the opening in the back of the thigh. I also opened an abscess in the left breast, and another in the left arm close to the axilla. The pus from all these abscesses was of a greenish colour, and had no odour. No other abscesses were apparent at this time.

She began to improve rapidly, and the abscesses in both legs below the knees and those in the breast and arm healed satisfactorily.

March 11.—Dr. Marshall again gave chloroform, and I opened a large abscess in the right buttock, which had shown its presence within the last week. I also opened another, in the middle of the inner side of the right thigh. The pus was burrowing under the fascia lata of the left thigh, so I made an opening on the outer side of the thigh, and drew a large tube from the top opening, and also one right across the thigh to the opening behind. I also opened a large one in the left axilla. After this she improved rapidly, and in a fortnight there was little or no discharge. By April 9 the wounds had healed, and she was able to sit up, but could not walk without assistance. The left leg was back to its normal size.

April 20.—She is able to walk a little. Although she has never complained of any pain in the pelvis, there has been some hardness and tenderness along the left side of the brim. On making a *per vaginam* examination to-day the cervix is felt low down. The external os admits the tip of the finger, and is slightly lacerated towards the left side. There has evidently been considerable laceration towards the left, indicated by a cicatrix. The left broad ligament has a large mass of cellulitis in it, and the left utero-sacral ligament is in the same condition. The uterus is fixed and retroflexed. The right side of the pelvis is free.

May 13.—The hot douche has been used regularly. The swelling in the broad ligament has disappeared. The uterus is still retroflexed and fixed. She is able to go about, and is gaining flesh rapidly.

I had lost sight of this patient for some years, but she has been in the hospital twice in the year 1904 with a three-months' abortion in January, and a seventh-month premature labour in November. She says she has had four other abortions.

In the first case there is nothing particular to be noted, except that, like the second, she was a primipara, which is very uncommon. The time of onset in both cases was the usual one—viz., the third and second weeks. In neither had there been a marked loss of blood, which is so frequently the case. The cause in both cases I believe to have been septic absorption. In the first we had the antecedent puerperal fever. The phlegmasia seems to have been the last effect of the septic mischief—its expiring effort, so to speak—and in that way it was a comparatively mild attack. The great bulk of the poison had exhausted itself during the puerperal fever. In the second case the origin was the same, I have no doubt, judging from the course it ran. It was a very much more serious case, because the poison concentrated itself in this one direction.

This second case presents some features worth considering. The left leg was affected in the usual way—*i.e.*, it began with pain in the calf, thrombosis, and then great swelling—in fact, it was a typical, severe case. Next the right leg was seized with severe pain, first in the buttock, and then in the calf, and the veins became even more thrombosed than in the left leg; but there was this difference, to which I wish specially to draw attention, that this right leg did not swell in the least—in fact, it became wasted. This fact goes to prove, what has often been held, that thrombosis of the veins alone does not cause phlegmasia, but that the lymphatics must also be involved. The condition of the pelvis, I think, explains why the left leg was affected. The left side of the cervix was lacerated by the occiput as it came down after turning, and through that laceration the septic absorption took place, and blocked the lymphatics and glands of that side. There was no laceration of the right side, so the lymphatics there escaped. It has long been recognised that the left leg is the one usually affected, on account of the left side of the cervix being more frequently injured than the right. This fact goes to prove that it is essentially a disease of the lymphatics.

Complications of the Respiratory System.—Bronchial catarrh and slight bronchitic attacks are not uncommon in the puerperium. If the cough is troublesome, it causes a good deal of abdominal pain, and should be relieved by a sedative mixture.

Phthisis.—This is only seen in patients who have developed the disease prior to the pregnancy. After delivery the condition is usually aggravated, and, if it has been at all advanced, a fatal issue may be looked for in a comparatively short time.

Pneumonia.—In some cases, as in Case I., this disease does not seem to be influenced by the puerperal condition, but in others, as in Case II., it is a most serious complication.

CASE I.—Mrs. McG., aged twenty-eight, 8-para, full time, was admitted in labour suffering from pleuro-pneumonia of the left base. Two days before admission she had begun to complain of pain in the left side of the chest and feverishness.

On admission, the temperature was 103° F., the face was flushed, the breathing hurried, the cough annoying, and the sputum rusty and tenacious. At the base of the left lung the movements were restricted, dulness was manifested, and there was distinct friction with tubular breathing and crepitations half way up the lung. The child was born alive twenty-four hours after admission. Next day the friction had disappeared, and there was evidence of a considerable amount of effusion. The whole of the left lung became involved, and râles could be heard at the base of the right, but no dulness. Herpes appeared on the lips and nose.

The disease ran a normal course, with the crisis on the eighth day, after which she convalesced steadily.

One could not say that the puerperal condition had in any way influenced the disease.

Case II.—Mrs. G., aged twenty, 1-para, full time, was admitted in the first stage of labour. On palpating the abdomen, the child was found to be lying in the first vertex position, but the head was free above the brim. The pelvis was a normal size, and the os would admit one finger. The fœtal heart was audible. The temperature was 101° F., the pulse 118. Moist râles and tubular breathing were heard at the left base, but there was no dulness.

The patient was given $\frac{1}{4}$ grain morphia suppository, and she rested, but did not sleep much during the night. In the morning the temperature was 99° F., and the pulse 112. The os was only a little more dilated. The pains came on strong, but the head did not engage. About 5.30 p.m. the temperature rose suddenly to 104·6° F., and the pulse to 144. The os was not quite fully dilated, but the condition of the patient was so bad that immediate delivery seemed called for. Under chloroform the os was dilated manually, and the child extracted by forceps. The child was dead. The cord was twice round its neck, and once round its shoulder, with only 7 inches free. This shortening of the cord had been the reason why the head would not engage. It had also caused the death of the child during delivery. There was some laceration of the vagina from which there was considerable bleeding. Several stitches were put in, and the vagina plugged.

As soon as the patient came out of the chloroform most alarming collapse came on. She seemed to be dying. She was freely stimulated with strychnine, ether, and brandy, and an intravenous injection of 2 pints of normal saline solution was given. She rallied in about ten hours. By next day there was dulness in the left lung, and it rapidly spread, until the whole lung was involved. The right lung also became involved, and nearly the lower half showed consolidation. Two days after delivery the right parotid gland began to swell, and showed all the signs of an acute parotitis. There was no evidence of pus in it, so it was not incised. The swelling had subsided considerably by the eighth day, when she died.

The pneumonia ran an acute course, with considerable delirium. There never was much cough nor sputum. The temperature remained about 103° to 104° F. throughout. There was no crisis. The patient died on the eighth day.

In both of these cases the usual treatment of pneumonia was adopted, and the patients were very freely stimulated. In the second case the parotitis might look like a septic complication, but, so far as we could make out, there was no septic involvement of the uterus. It is a rare complication of pneumonia in non-puerperal cases, so it probably had nothing to do with the puerperal condition.

The prognosis is certainly graver than in an uncomplicated pneumonia.

Scurvy.—On p. 42 I have dealt with scurvy as a complication of pregnancy. When it complicates the puerperium, as a rule, it has manifested its presence before delivery. In the following case, however, there was no indication of the disease until two days after delivery:

Case I.—Mrs. McL., 6-para, aged thirty, was admitted to the Maternity Hospital on December 25, 1904, suffering from pernicious vomiting which, she said, had begun on December 15. The patient considered herself to be between seven and eight months pregnant. The outdoor resident had seen her at her own home three days previously. The vomited matter at that time was coffee-ground in character.

On admission, she was very pale and emaciated. The temperature was subnormal, and the pulse 116 per minute. Over the right trochanter there were two sores about the size of half a crown, and over the left gluteal region there was a large patch of ecchymosis, said to be the result of a fall a month previously. Below the left eyebrow there was a small black nodule. There was no indication of labour.

The patient stated that her husband had been out of work for eight months, and that she had not been able to get proper food, even when she could take it. Since the vomiting had come on, she had not been able to retain anything.

Treatment.—All feeding by the mouth was stopped, and rectal enemata of peptonized milk were given four-hourly, and $\frac{1}{60}$ grain of strychnine hypodermically night and morning.

December 29.—Sips of hot water were given to allay her thirst.

January 2, 1905.—Peptonized milk and soda-water were given by the mouth.

January 3.—The patient delivered herself of a live premature male child. There had been no vomiting since admission. Half an ounce of brandy was given by the mouth every four hours.

January 5.—The patient began to complain of great pain in the feet, especially in the left one. Within a few hours the toes and half of the left foot, both on the dorsal and plantar surfaces, became of a deep purple colour, cold to the touch, in places anæsthetic and in others hyperæsthetic. On the dorsal surface there was a large bulla extending from the base of the toes to the upper limit of the discoloration. The line of demarcation was very sharply defined, both to the eye and to sensation. The right foot was dull reddish in colour, and on the third and fourth toes one or two small dark purple patches were noticed. There was a purpuric rash on both elbows, and also on the knees and buttocks. The lobe of the right ear and tip of the nose were purplish in colour, and there was a small necrosed patch on the nose and another at the left angle of the mouth. The interior of the mouth was quite healthy looking, and there was absolutely no indication of any sponginess of the gums.

Professor Stockman kindly saw the case with me, and gave it as his opinion that the condition was due to scurvy. As the stomach condition precluded ordinary vegetable diet, he advised giving the juice of vegetables, such as turnips, and also raw meat-juice.

The juice of four turnips seasoned with salt and pepper was given daily, and also at intervals 3-drachm doses of raw meat-juice. No medicine was given except hypodermic doses of strychnine night and morning. She began to improve at once, and in a very short time was able to take a full vegetable diet.

On January 17 the bulla of the left foot was opened, and a thin reddish serum was evacuated. The dead skin was removed, and the part dressed with wet boracic lint.

The patient was dismissed on February 25. The right foot had completely recovered. The toes of the left one looked healthy, except the tips of the little and next toe, which were still blue and dead-looking. The patient had put on flesh, and her skin had a very healthy appearance. All the other sores had healed.*

The child was very weakly, and only lived a few days. It did not show any evidence of scurvy.

On p. 42 I have recorded the only other case of scurvy which I have seen in connection with pregnancy. It was a much milder case, and showed sponginess of the gums, which is generally present. In the present case the absence of this important indication made me somewhat doubtful of my diagnosis, but Professor Stockman was quite positive in his diagnosis, and the result of the treatment proved his accuracy. The left foot looked as it it were affected with gangrene, and I was afraid that the toes, at least, would slough off.

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* After the patient went home all the toes of the left foot necrosed and partly dropped off. The second phalanges projected from the stumps, and it was necessary to remove them.

Mammary Complications.—During pregnancy there is always a considerable increase in the size of the breasts. From an early date milk can be expressed from the nipples. Many patients suffer a good deal of uneasiness in the breasts, which may even amount to pretty severe pain. The patient may suffer from an actual mastitis, which may go on to suppuration. The cause of the mastitis has probably been an injury, such as a blow upon the breast. I have seen a number of cases of this. In one, a primipara, about eight months pregnant, the temperature was 105° F. when I opened the abscess. The abscess healed in a very short time, and she went to full time. The high temperature had no bad effect upon the fœtus.

During pregnancy the breasts, especially of primiparæ, should be attended to. The nipples, if they are small and depressed, should be drawn out, and in all cases they should be bathed occasionally with equal parts of eau de Cologne and water or glycerine, or any spirit lotion, but if they tend to become too hard, lanoline should be applied. If a mastitis occurs it should be treated by sedative lotions for the pain, and if it does not resolve, hot boracic poultices, free incision, and drainage, as soon as pus can be detected.

Within forty-eight hours after delivery the breasts usually begin to engorge with milk, and for a day or two after that may be very swollen and tender. Hard, tender lumps may be felt in different parts from accumulation of milk in separate lobules. The temperature will usually be raised a degree or two. If the breasts are not carefully attended to, actual inflammation is very likely to ensue, especially if there be any excoriation or chapping of the nipples. If there is an abrasion of the nipple, it is easy to understand how septic organisms may gain entrance from the child's mouth, or from the patient's fingers or dress. In most cases of mastitis, going on to suppuration, an abrasion or fissure of the nipple will be found, but micro-organisms may find their way into the ducts without there being any superficial lesion. When suppuration is occurring, the temperature will rise considerably, and there may be rigors.

Fissures and excoriations of the nipples cause intense suffering during suckling. The nipples should be very carefully washed with boracic solution, before and after suckling. An application of glycerine of tannic acid and sulphurous acid, or of tr. benzoini co. is useful. Where there are fissures, touching them with a slender pencil of silver nitrate will assist matters. The difficulty in getting abrasions and fissures to heal is that suckling tends to keep them open. To prevent this as much as possible, the patient should use a nipple-shield, but warn her to be very careful to keep it clean.

When the breasts are engorged and lumpy they should be massaged, rubbing towards the nipple, using warm olive-oil on the hand. An exhauster may also be used, and the patient should be given a brisk saline purge.

If a large area becomes hardened and inflamed, belladonna should be applied and hot fomentations. The patient should be actively purged, and should take as little fluid as possible. If resolution does not take place quickly, suppuration will occur. Boracic poultices should be applied until softening, and then the abscess should be freely opened and drained. A free incision is absolutely necessary, and it should radiate from the nipple, so as not to cut across the gland tubules.

Among the poorer classes poulticing is often resorted to until the abscess bursts. The whole breast may in this way be destroyed. Poulticing should only be allowed until softening has occurred, when an incision should be made. I have known a woman use cow-dung poultices until her whole breast was riddled with sinuses.

If the abscess is small, the other breast can be given to the child, and after healing has occurred, both breasts ; but if the abscess is large, the child should be weaned, and the other breast should be firmly bound up after applying belladonna to it.

If there has been much destruction of breast-tissue, the patient may not be able to nurse subsequent children with that breast.

Galactocele.—Occasionally, from obstruction of a lacteal duct, a retention cyst forms in the breast. It should be incised.

Supernumerary nipples, with or without mammary tissue, are occasionally seen. They may be near the breasts, or in different parts of the body, as in the groin.

Occasionally there is a third breast, and I have several times seen lobules in the axilla, quite free from the main mass, but connected with it by lacteal ducts. In one case there was a swelling in the upper and inner part of the arm near the axilla, which was so painful that I incised it. It was inflamed, and there was fluctuation in the mass. As the patient had several abrasions on her fingers, I thought it was an inflamed and suppurating gland, but it turned out to be a galactocele.

Hypertrophy of the breasts is not very common in this country, but I have occasionally seen cases of it. Among some savage races it is quite common. The breasts are often so pendulous that the child can suck while being carried on the mother's back, a rather convenient arrangement when the tribe is on the march.

As a rule, there is amenorrhœa during lactation, but a fair number of patients menstruate. In some cases the milk is affected during menstruation, and it may disagree with the child. If the child is much upset, it should be weaned.

The idea is pretty general that a nursing woman is not liable to become pregnant, and among a certain class this is so firmly believed in that the women nurse their children well on into the second year, and even longer. This should be strictly forbidden, as it is bad for both mother and child. From nine to ten months is long enough for a child to be at the breast, unless it is delicate, when it may be allowed a month or two longer. Occasionally the child does not thrive on its mother's milk. The milk may be insufficient in quantity, or it may be deficient in some of its ingredients, especially in fat. The mother should be liberally dieted, and if this fails to bring the milk up to the standard amount and quality, the child must be partially fed with artificial food. If it does not thrive on the mixed food it must be weaned. Malt liquors will usually increase the milk flow, but one must be careful in recommending them. Drugs are of very little use to increase the flow. Drugs which may be administered for other purposes will be excreted in the milk, and may affect the infant. I have occasionally seen infants refuse the breast when the mother was taking large doses of quinine. Purgatives taken by the mother will generally act upon the infant. In syphilitic cases, if the mother is taking mercury, the infant will get the benefit of it.

Complications of the Nervous System.—Nervous complications which may arise during pregnancy have already been dealt with. These diseases may be continued on into the puerperium, but in some cases they manifest themselves for the first time during that period.

Paralysis.—If a woman has had para- or hemiplegia prior to delivery, the condition will continue during the puerperium. If the condition has been really due to the pregnancy, there is a good chance of her complete recovery. If it is an old-standing condition, there is little probability of improvement. Where the lesion has occurred during labour or the puerperium, if it has not been a serious one, recovery will probably occur.

We sometimes find a partial paralysis of one leg for some days after a difficult delivery. This has been caused by pressure upon the pelvic nerves during the passage of the child's head. The sensory portion of the nerves may be more affected than the motor, and the woman then suffers great pain without much impairment of movement.

Treatment.—Perfect rest; absorbent medicines, such as iodides; and careful nursing to prevent formation of bedsores.

Eclampsia and Chorea may arise during the puerperium, but they are more frequently continued from pregnancy or labour. They have already been dealt with in connection with Pregnancy and Labour, and nothing more need be added.

Insanity.—There is the so-called *transitory mania* of labour, which is so often given as an excuse when a mother takes the life of her child immediately after it is born. There is no doubt that some women are beside themselves from their sufferings during labour, but transitory mania is an exceedingly rare condition. It is curious that it usually attacks unmarried women. I firmly believe that the great majority of women who do harm to their children, when in this condition of supposed mania, know perfectly well what they are doing, and are quite responsible for their actions.

The insanity of pregnancy has already been dealt with. It may be continued from the pregnancy into the puerperium, but a large number of cases arise during the latter period. It may begin later, during lactation. About 18 per cent. arise during pregnancy, 47 per cent. during the puerperium, and 35 per cent. before the end of lactation.

Melancholia is the usual type during pregnancy and lactation, while mania occurs more frequently during the puerperium.

The same predisposing causes are at work as in pregnancy. In many puerperal cases it is associated with more or less sepsis. In all the cases I have seen there have been high temperatures. In some cases superinvolution of the uterus occurs. The exhaustion of hæmorrhage and of prolonged lactation are both frequent predisposing causes.

Symptoms.—Sleeplessness, restlessness, and great dislike for the child and near relatives, or the immediate attendants, are the first indications. In mania there will be great excitement and noisy delirium, while in melancholia the patient will become profoundly depressed, and may refuse to speak or take any nourishment. She may become very fevered and her pulse-rate very fast. Suicidal tendencies are apt to exist. In one case I saw, the patient was apparently quite well in the morning, but in less than ten hours she had sunk into a condition of profound melancholia, and refused to speak. Her temperature had suddenly risen to 104° F., and the pulse to 130. Next morning she attempted to cut her throat with a table-knife when her attendant had left her for a few minutes. Fortunately the knife was very dull, so she did little damage, but if she had got hold of a razor or a sharp knife the result would probably have been fatal. She was at once removed to an asylum, where she recovered.

Prognosis.—This is generally favourable, especially in cases which occur early in the puerperium. It is not so favourable in cases of profound melancholia commencing late in lactation. There is considerable risk of recurrence in subsequent pregnancies.

Treatment.—The patient must be constantly watched, and as she has probably taken a dislike to her friends, her attendants had better be strangers. The child must be kept away from her, so it must be weaned. Food must be given frequently, by force if necessary. For sleeplessness, hypnotics, such as sulphonal, trional, chloral, or bromides, will be necessary. Where there is anæmia and much prostration, iron and arsenic should be administered, and stimulants, when the condition of the pulse indicates. If there is a septic condition present, it must be treated. In two cases, I have seen remarkably good results from the use of antistreptococcic serum. Not only did the temperature fall, but the patients' mental condition improved at once. They both recovered. If proper attendants can be got, a patient can be quite well treated at home, but in many cases, more especially if there is any suicidal or homicidal tendency, it is much better to send her to an asylum.

CHAPTER XXXVIII

OBSTETRIC OPERATIONS

Preparation of the Patient for Delivery through the Natural Passages—Anæsthesia—Spinal Anæsthesia—Spinal Anæsthesia in Obstetrics—Version or Turning—Cephalic Version—Podalic Version—Methods of doing Podalic Version—External Method—Bipolar Method—Internal Method—Combined Internal and External Method—Risks of Version to the Mother—To the Child—The Forceps—Conditions in which the Application of Forceps is Necessary—Preparations—Position of the Patient—Application of the Blades—Traction—The Amount of Force to be Used.

PREPARATION OF THE PATIENT FOR DELIVERY THROUGH THE NATURAL PASSAGES.

IN all cases the bowels should be thoroughly cleared and the bladder emptied. The external genitals of the patient should be cleansed by washing very thoroughly with lysol solution. Shaving of the parts in the more serious operations is advisable in hospital patients, but in private work is undesirable; if the hair is long, however, it should be clipped short. In forceps cases douching of the vagina before applying the instruments is not necessary, unless the vagina is in an unhealthy condition, but in versions, inductions, and destructive operations the vagina should be very thoroughly douched out. Lysol solution is the best to use, and, while douching, the whole of the vaginal wall should be well scrubbed with a pledget of sterilized wool. Some use aseptic soap for this, but the lysol does quite as well as any soap. While every effort is made to make the external genitals and vaginal canal as aseptic as possible, the operator must see that his hands, arms, and instruments are also in that condition. If due care is exercised, he need have no fear of causing sepsis, but if he is not careful he need not be surprised if many of his patients exhibit high temperatures, and some of them die of septicæmia. An obstetric operation should be undertaken with just as much care as a gynæcological or surgical one, and until this is realized puerperal septicæmia will yearly claim its toll of victims. There are certain cases in which no amount of care will prevent septicæmia arising, but these are rarely met with, and it is seldom one can look back upon a fatal case of septicæmia without a lurking suspicion that the woman's life would not have been lost had greater care been exercised.

Anæsthesia.—As a rule, an anæsthetic should be administered, though many of the operations can be performed without it. As it saves suffering and causes no additional risk, it is a distinct gain. In cases where relaxation of the uterus is required, it should be pushed to its fullest extent. Chloroform is almost universally used in Scotland, and it is the handiest, as it can be given so easily. Even in bad cardiac cases it is not contra-indicated. It increases the tendency to post-partum hæmorrhage, but not so much as ether does. This danger can be easily guarded against by grasping the uterus and massaging it, after the child is born, so as to induce firm contraction and retraction.

Spinal Anæsthesia.—For several years, a method of inducing anæsthesia by the injection of a solution of cocaine into the subarachnoid space in the lumbar region has been in use, especially on the Continent and in America. It has now been pretty extensively used in general surgery, and to a less extent in obstetrics.

Method of inducing Spinal Anæsthesia.—Tuffier of Paris, after a large number of experiments, has elaborated a method which is usually followed. He uses a needle about 4 inches long, made of platinum, with a short iridium point. The skin of the lower dorsal and lumbar region is rendered aseptic in the usual way. The patient is placed in a sitting posture with the back well arched forwards, so as to separate the laminæ of the vertebræ as much as possible. The spine of the fourth lumbar vertebra is now located. In stout patients it is difficult to feel the spine, but a line joining the highest points of the iliac crests will cross the level of the fourth spine, and may be adopted as a guide. The needle is inserted 1 centimetre below and outside the spinous process, and directed vertically downwards and slightly inwards until it enters the interval between the laminæ of the fourth and fifth lumbar vertebræ and penetrates the subarachnoid space. When it has penetrated into this space, clear cerebro-spinal fluid will escape through the needle. One cubic centimetre of a 2 per cent. sterilized solution of hydrochlorate of cocaine ($\frac{1}{3}$ grain) is now very slowly injected, the needle withdrawn, and the puncture sealed with collodion. The strictest aseptic precautions must be used. The needle and syringe should be boiled immediately before being used, and the solution must also be sterilized and freshly made. It may be boiled, or capsules of specially prepared cocaine may be used.

The injection causes very little pain to the patient, but difficulty is sometimes experienced in entering the subarachnoid space. The needle may strike the bony lamina, and in some cases of deformity the vertebræ may be so anchylosed as to make it impossible to enter. The escape of cerebro-spinal fluid will indicate when the space has been entered. Sometimes no fluid will escape, although the needle has penetrated the space, from its point being entangled in the membranes. It should be withdrawn a bit and moved about. If a vein is punctured blood will come. When there is any difficulty in entering the space, the needle should be withdrawn and a fresh puncture made.

The analgesia commences almost immediately, and will usually be complete in from five to ten minutes, but it may be delayed slightly longer than this. It is usually complete from the diaphragm downwards, but in some cases it extends even as high as the upper extremities. The duration is also somewhat variable, but it usually lasts about an hour; it may only last for thirty minutes, or be prolonged for three and a half hours.

Within a few minutes of the injection the patient experiences a feeling of malaise, with some respiratory anxiety. Many patients have sensations of heat, and complain of thirst. Within ten or fifteen minutes of the injection nausea and vomiting often occur. The pulse is slightly quickened and the tension lowered. If too large a dose has been given, respiration will be affected, and danger may arise from this cause.

After the analgesia the patient usually feels very comfortable. Slight sickness may continue, but it is often entirely absent. Severe headache is, however, a very constant symptom. It usually comes on six or eight hours afterwards, and may be very overpowering. It may last for several days. In some cases it comes on three or four days after the operation. In about half the cases there is a rise of temperature and sometimes a rigor within a few hours of the injection. The rise is usually slight, but it may reach 103° F. It subsides rapidly, and seems to have no significance.

For ordinary surgical operations on the lower part of the body or lower extremities this method of producing anæsthesia seems very suitable. There seems to be very little risk from it, if the strictest aseptic precautions are taken, but there have been a few deaths. For prolonged intraperitoneal operations it is not very suitable. The patient is perfectly conscious, but experiences no pain. Pressure sensations are felt, and a hysterical patient may flinch and cause trouble, so it is not suitable in such cases.

Spinal Anæsthesia in Obstetrics.—The effect of lumbar injections of cocaine during labour is to render the labour painless, provided it is not prolonged. Complete analgesia may be relied upon for from one and a half to two hours, or even longer in some cases. The injection may be repeated, and Marx has in this way been able to maintain complete anæsthesia for eight hours, but repeated injections are somewhat risky, from the toxic effects of the cocaine. Marx advises giving the injections when the os is three-quarters dilated in multiparæ, and when fully dilated in primiparæ.

Besides the analgesic action, the cocaine has an oxytocic action. Doléris has drawn special attention to this. He maintains that the uterine contractions are increased in force and frequency, dilatation of the cervix hastened, and the second stage of labour shortened. He also believes that uterine retraction after delivery is more complete, and the risk of post-partum hæmorrhage thus lessened. In cases of uterine inertia he has observed the contractions to return after the injection of $\frac{1}{5}$ grain of cocaine.

He says: "I am in a position to state positively from these facts that whenever uterine contraction becomes sluggish and short, and occurs at long intervals, an injection of 1 centigramme of cocaine is sufficient to produce remarkable stimulation of the uterus. This stimulating action manifests itself, not only when contractions are weak and far apart, but also when during labour they have stopped altogether, as in the well-known phenomenon called uterine inertia."

In two cases in which he used the injection to induce labour the results were so remarkable that I shall quote them in full.

"The first patient was a woman with a seven months' fœtus, dead and macerated, who had been sent to our wards from a house of refuge with the exact diagnosis, but whom we kept under observation for three weeks as a measure of prudence. Labour began suddenly, by the very energetic contractions of a uterus that had been flabby and inert for about a month, fifteen minutes after the injection. During an hour and three-quarters the contractions followed one after another regularly and in close succession, without causing pain. The cervix, long and closed, became effaced, and dilated rapidly to the dimensions of a five-franc piece. From the moment when the analgesia disappeared the contractions became less frequent, and assumed the character that is customary in normal labour, which shows once more the oxytocic effect of cocaine following a corresponding course to its analgesic action. Labour thus begun went regularly on, and spontaneous delivery took place in six hours and twenty minutes. The relatively short time in which this was accomplished will be appreciated when we remember how slow and difficult the dilatation is in these cases of macerated fœtus, where there is no accommodation to the pelvis and no water tension, both being incapable of bringing any regular and energetic pressure to bear so as to hasten the disappearance and dilatation of the cervix.

"In the second case labour began more quickly. The patient was a consumptive in the last stages, short of breath, cachectic, very weak, and likely to die before her confinement. She had had a number of children, and the present pregnancy was eight months and one week gone, with a living child. Nine minutes after the injection the uterine muscle contracted energetically for a minute and a half, and from that time on contractions took place regularly every three minutes up to delivery, which occurred in four hours and thirty-five minutes."

Doléris comes to the following conclusions: "(1) The lumbar injection of cocaine is contra-indicated with pregnant women; if the method were used for the execution of any operation during pregnancy, miscarriage might ensue. (2) A new method of bringing on labour has been found in the use of these injections, which have a certain effect on the uterine motor nerves. (3) This process may render great service in case of uterine inertia during labour, particularly with a moderately contracted pelvis, as I have found in two instances. (4) In eclampsia, where rapid evacuation of the uterus is indicated, the lumbar injection ought to be efficacious, and may have a happy effect on the nervous reflex symptoms" (*International Clinics*, vol. ii., eleventh series).

For the performance of forceps operations this method of anæsthesia is suitable, but in obstructed labours, especially where version is required, it is decidedly contra-indicated, as you wish to have the uterus as relaxed as possible. Doléris has performed Cæsarian section under it, and he found that the uterus retracted remarkably well, and there was very little bleeding. Sinclair, of Manchester, has also performed Cæsarian section under it. As I have never used it, I cannot speak from personal experience, but I doubt very much if it will ever come into general use.

If the oxytocic action is so great as Doléris maintains, it will certainly be useful in cases where one wishes to stimulate uterine contractions where there is no obstruction to delivery ; but Lea, in his paper in the first number of the *Journal of Obstetrics and Gynæcology of the British Empire*, points out that Kreis used forceps in three out of six cases, and Marx in sixteen out of forty cases, which hardly bears out Doléris's contention.

VERSION OR TURNING.

The object of this operation is to change one presentation into another. It may be the head which is substituted for some other part, but more usually it is the breech. Transverse presentations are the typical ones for version.

1. **Cephalic Version.**—In this the head is substituted for some other part of the body in a transverse presentation. It is done by external manipulation while the membranes are intact, and is only practicable when the liquor amnii is abundant. The patient should lie upon her back, with her knees well drawn up. Between the pains the head is pushed towards the pelvis and the breech in the opposite direction. If a pain comes on, the parts are supported until it has passed off. As soon as the head is at the brim, the membranes should be ruptured, and the liquor amnii allowed to escape, so as to fix the head in the brim and prevent it taking up its old position. It may be assisted by passing the fingers into the cervix and tilting the head into the brim, as in bipolar version.

2. **Podalic Version.**—In this the breech is the part substituted. It is the method of delivery most frequently adopted in cases of antepartum hæmorrhage, no matter whether the presentation is cephalic or transverse. It is also used in transverse cases, where cephalic version cannot be done. As already mentioned, it was formerly much used in flat pelves, but the use of axis-traction forceps has to a great extent superseded it. In posterior parietal presentations, however, it is preferable to forceps. In face and brow cases, some cases of prolapse of the cord, and in cases where rapid delivery is called for in the interest of the mother, as with eclampsia, it is done.

METHODS OF DOING PODALIC VERSION.

1. **External Method.**—This can only be done before the rupture of the membranes, and when the liquor amnii is abundant. It is done by external manipulation, in exactly the same way as cephalic version, only it is the breech which is manipulated into the pelvis instead of the head.

2. **Bipolar Method.**—This method of version was introduced by Braxton Hicks in 1864. It is done by external manipulation, combined with tilting the presenting part away from the brim by the fingers of one hand in the vagina. The membranes should be intact, or only very recently ruptured. If the uterus is retracted it is quite impracticable. It may be used in doing cephalic version, but is more generally employed in podalic. In cases of placenta prævia it is most useful, as it can be done as soon as the os will admit two fingers.

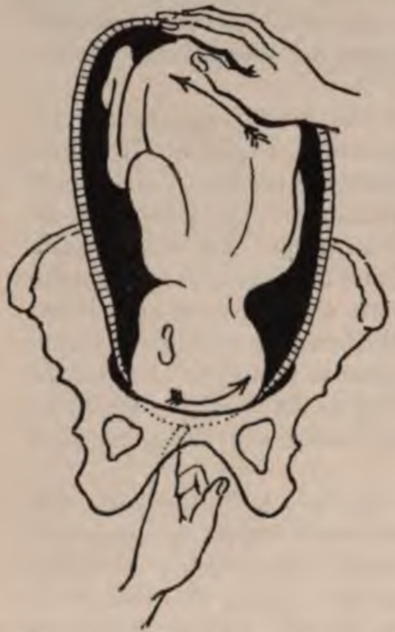

FIG. 51.—BIPOLAR VERSION: FIRST STEP (AFTER BARNES).

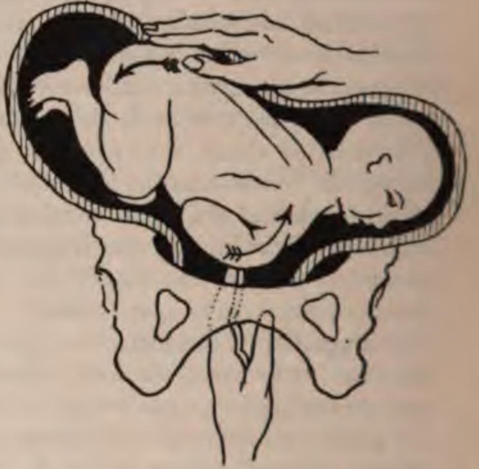

FIG. 52.—BIPOLAR VERSION: SECOND STEP (AFTER BARNES).

The patient should be placed upon her back and be deeply anæsthetized to relax the parts and allow the whole hand to be pushed into the vagina. The external hand is placed over the breech so as to depress it, while the presenting part is tilted away from the brim by the fingers inserted through the os. The child should be made to rotate so as not to undo its flexed attitude (Figs. 51 and 52). When the head is out of the brim the external hand can be used to elevate it towards the fundus (Fig. 53). As soon as a knee or foot comes within reach of the internal fingers it should be caught and brought into the brim, the membranes being ruptured at the same time (Fig. 54). If the os is fully dilated, delivery may be finished at once, but if the os is only partially dilated, it must be left to nature to allow of dilatation.

3. **Internal Method.**—This is done by passing one hand into the uterus, seizing and bringing down one or both feet. The cervix must be sufficiently dilated to allow the hand to pass. It should be done as soon as possible after the membranes have ruptured. If there is only slight retraction of the uterus it may be done, by an expert operator, by deeply anæsthetizing the patient, but one who has not had much experience of the operation should not attempt it. If the uterus is firmly retracted it should never be attempted. The patient may lie on her left side, or preferably on her back. The right hand may be used in all cases, but in some the left one does better. It depends on which way the child is lying. Use the hand which will most easily reach the front of the child. Thus, if its back is towards the mother's right side, use your right hand, and if the back is towards her left, the left hand; but if you are not accustomed to working with your left hand, always use the right. The hands and

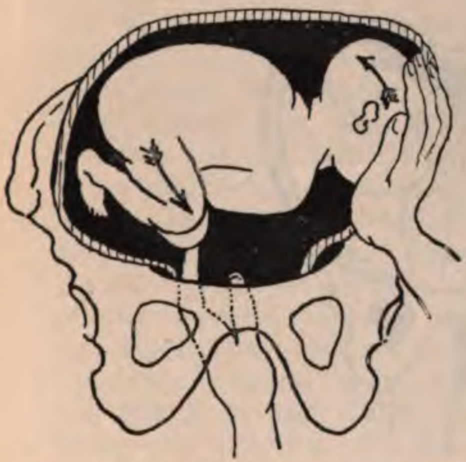

Fig. 53.—Bipolar Version: Third Step (after Barnes).

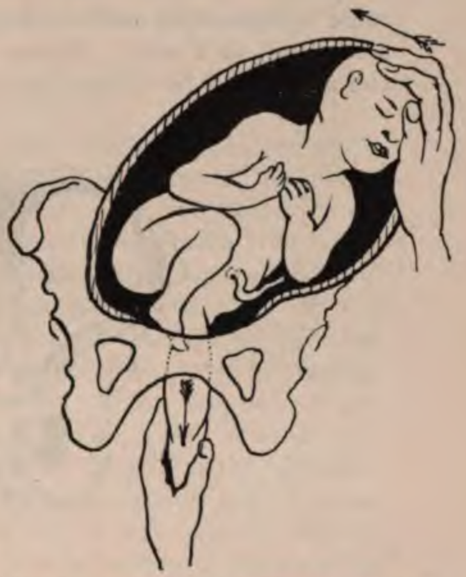

Fig. 54.—Bipolar Version: Fourth Step (after Barnes).

arms should be thoroughly sterilized, and well washed in lysol solution. Pass the hand in a cone shape to dilate the cervix, if it is not sufficiently dilated already, and pass the hand on to the front of the child, rupturing the membranes if they are unruptured (Fig. 55). As much of the liquor amnii as possible should be retained in the uterus by damming it back with the wrist. If a contraction comes on, spread your hand flat on the front of the child and wait until the uterus relaxes. If you do not do this the pressure upon your closed hand will almost paralyze it, and may cause rupture of the wall. Catch one or both feet, making sure it is a foot and not a hand. Herman advises bringing down a hand first and attaching a bit of tape to it. This I consider to be a mistake.

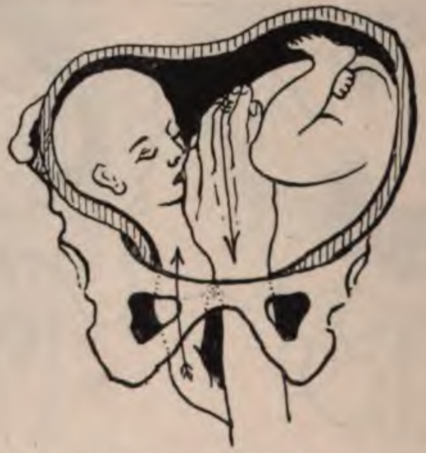

FIG. 55.—PODALIC VERSION: INTERNAL METHOD (AFTER BARNES).

As soon as you get a foot, pull the leg down steadily into the vagina, if the uterus is quiescent, but if a contraction comes on, wait, spreading your hand out as before. The child's body usually rotates quite easily, unless the uterus is retracted round it. If version is attempted when the uterus is retracted, as in a transverse case, care must be taken to unhitch the shoulder from under Bandl's ring, if it is caught, but only an expert should undertake such a risky operation, and it should only be undertaken if there is a chance of saving the child's life.

4. **Combined Internal and External Method.**—The internal hand is used in exactly the same way, but with the external hand the head is pushed towards the fundus.

Which Foot should you Grasp?—When the head presents, it does not matter much which foot you seize, but in transverse presentations it depends upon whether the child lies dorso-anterior or dorso-posterior. If it is dorso-anterior take the nearest foot, and if it is dorso-posterior that farthest away (Fig. 55). When the child's back is to the front, you want it to remain so, and you therefore seize the nearest foot, as traction on it will not rotate the body round its long axis, but when it is to the mother's back, you wish to turn it to the front; therefore seize the farthest away foot, as traction on that leg will not only turn the child, but rotate its back to the front.

RISKS OF VERSION.

1. **To the Mother.**—Besides the risk of introducing septic organisms into the uterus, there are risks of injury to the uterus, cervix, vagina, and perineum. The uterus may easily be ruptured. I have already spoken of the risk of attempting version after failing to deliver with forceps, and I again insist that if forceps hold, and do not bring the head down, version should not be attempted. Most of the cases of rupture of the uterus brought into the Maternity Hospital have been caused in this way. The cervix may be ruptured by dragging the after-coming head through too rapidly. If this happens in a case of placenta prævia, death from hæmorrhage is almost sure to ensue, if the cervix is not at once stitched or plugged. Rupture of the vagina and perineum may occur if the head is delivered too hastily and extended.

2. **Risks to the Child.**—The leg or legs may be injured, fractured or dislocated. The arms may be broken or dislocated in relieving them, and the clavicles may suffer in the same way. The neck may be so stretched as to cause dislocation, or the cord may be injured without actual breaking of the neck. In contracted pelves the skull may be fractured by the pressure of the promontory, and in some cases hæmorrhage occurs into the brain, without actual fracture of the skull. The child runs exactly the same risks during delivery as when the breech presents, and traction has to be used.

The Forceps.—The Tarnier-Simpson axis-traction forceps of Milne-Murray and of Professor A. R. Simpson are the instruments I have found most useful. Their great advantages over the ordinary instrument specially appear in high cases, but in low cases they also possess advantages, so that they are adapted for all deliveries. The traction rods enable one to pull in the proper axis, while the handles indicate the direction of the axis.

Conditions in which the Application of Forceps is Necessary.—These have already been mentioned in discussing laborious and other labours, so we shall merely recapitulate. They are: Uterine inertia, large size of the head, malpresentations and malpositions of the head, hardness of the head, rigidity of the vagina and perineum, contraction of the pelvis (conjugata vera not below 3 inches as a rule, but delivery may sometimes be effected with a conjugate of not more than 2¾ inches, if the child's head is small), in some cases of tumours, and in cases where rapid delivery is called for in the interest of the mother or the child. In breech cases forceps are occasionally applied to the breech, and sometimes to the after-coming head.

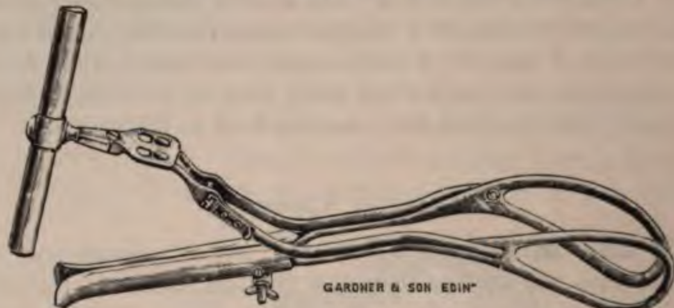

FIG. 56.—MILNE-MURRAY'S AXIS-TRACTION FORCEPS.

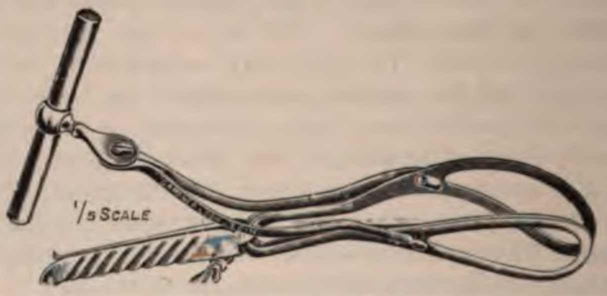

FIG. 57.—PROFESSOR A. R. SIMPSON'S AXIS-TRACTION FORCEPS.

Preparations.—The consent of the friends of the patient must be obtained, and also that of the patient, unless she is extremely nervous. Chloroform is not always necessary, but it is best to give it unless the patient strongly objects to its use. It will save her suffering and make the operation much easier. The patient's bowels and bladder should be empty, and the external parts thoroughly cleansed. The instruments, which should be aseptic, are frequently lubricated with an antiseptic oil or vaseline, but if they are dipped in warm lysol solution they will be slippery enough, and there will be less risk of carrying sepsis into the uterus. Antiseptic oils or vaseline are frequently far from being aseptic.

Position of the Patient.—In this country the left lateral position is the one most frequently adopted. The hips should be brought well over the edge of the bed, and the legs should be well drawn up. If the dorsal position is adopted, the hips must be brought well over the edge of the bed, and the legs and thighs well flexed and supported by assistants. The bed should be properly protected by a waterproof sheet and draw-sheet.

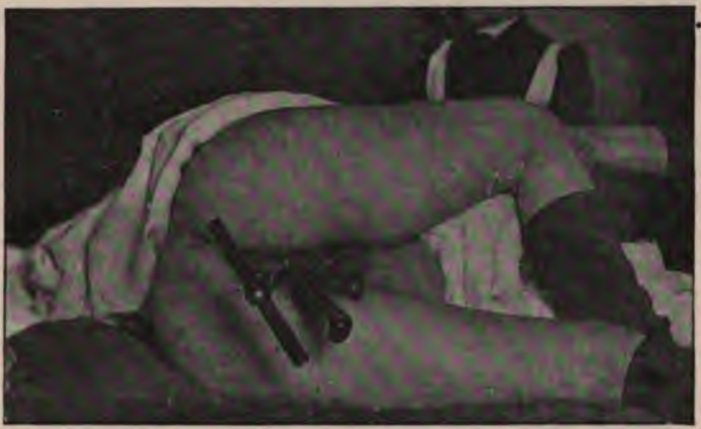

FIG. 58.—AXIS-TRACTION FORCEPS APPLIED: HIGH OPERATION.
From a photograph supplied by Dr. G. Balfour Marshall.

Before applying the instruments the os should be fully dilated, the membranes ruptured, and the exact position of the head known. The blades are made to lie in the sides of the pelvis, and therefore in the high operation they grasp the head obliquely in a normal pelvis, or antero-posteriorly in a flat pelvis. Some authorities say that the blades should always be applied to the sides of the head even in high operations. This is quite impracticable in the majority of cases. One blade will lie over the temple and eye of the child, but beyond bruising the parts a little it should not do any damage. If the instruments are not properly made, considerable damage may be done.

Application of the Blades.—The left or lower blade is the first to apply. The traction rod should lie along the back of the shank. Either hand may be used, but the left is perhaps the more convenient of the two. Grasp the handle lightly in the left hand, pass the fingers of the right into the vagina, with the tips inside the os, the palm looking upwards, then slip the point of the blade along the palm of the hand and front of the fingers until it passes within the cervix. Next push it gently upwards and forwards, depressing the handle at the same time until it lies against the perineum. The blade should lie exactly in the left side of the pelvis. No force should be used. An assistant should now steady it in position. The upper blade is generally more difficult to apply, but with a little practice it is easily done. An assistant should hold the leg up. First swing the traction rod well forwards, then grasp the handle lightly in the right hand, pass the fingers of the left hand into the vagina until the tips are within the os, the palm looking downwards, then enter the tip of the blade in the axis of the outlet—*i.e.*, with the shank and handle parallel to the flexed thigh ; now pass the blade along the palm of the hand and front of the fingers, gradually bringing the handle back towards the perineum. The tip of the blade should pass up the back of the pelvis, and then gradually come round to the side, and slip over the head. As it slips over the head the handle comes back towards the perineum. Locking

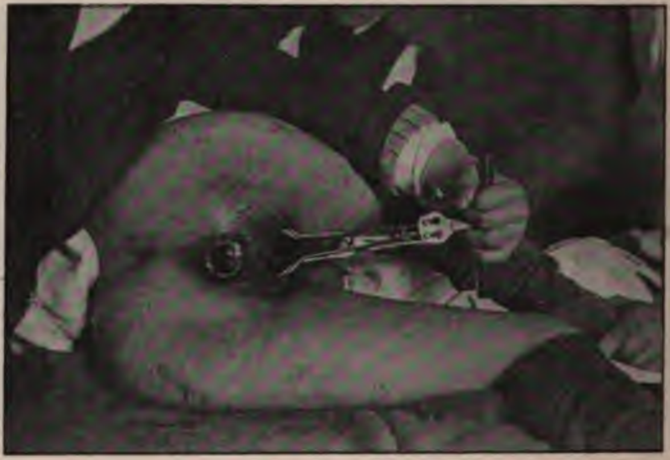

FIG. 59.—FORCEPS DELIVERY : THE HEAD IS DISTENDING THE PERINEUM.
From a photograph supplied by Dr. G. Balfour Marshall.

the handles is sometimes rather difficult, but no force should be used. Grasp each handle separately, and gently manipulate them into exact apposition, and lock them, being careful not to nip the vaginal mucous membrane or the skin of the external parts in the lock. Then swing the traction rod of the right blade back, and lock it. The fixation screw of the handles should now be applied, tight enough to fix the handles in the position in which you have locked them with your hand. If the application handles do not come quite together, you must not use the screw to bring them together, or you will crush the head. The fixation screw is only to fix the handles in the position in which you can close them with your hand, and should never be used to screw the handles together. Now apply the crossbar to the traction rods. Before applying traction, examine caretully to make sure that everything is right, and that none of the pubic hairs are caught in the lock.

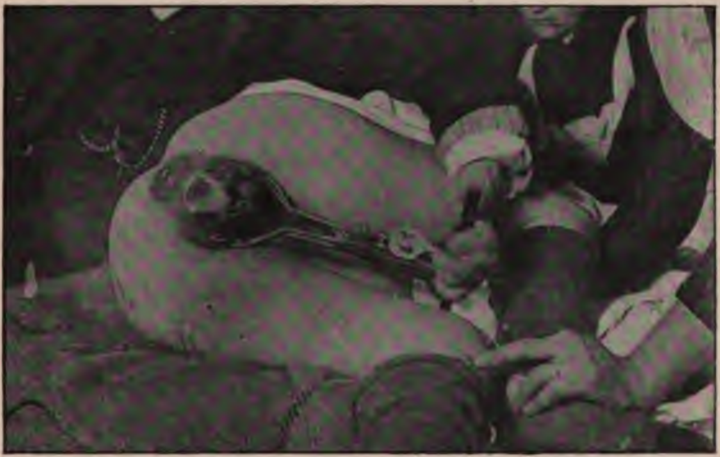

FIG. 60.—FORCEPS DELIVERY: THE HEAD IS JUST PASSING THE VULVA.
From a photograph supplied by Dr. G. Balfour Marshall.

Traction.—Grasp the crossbar in one hand and pull gently, so that the traction rods are parallel with the shanks. As soon as the application handles begin to pass forwards, move the traction rods forwards, so as to keep them parallel with the shanks. If the patient is under chloroform, make traction at intervals, always relaxing the fixation screw when not pulling. If the patient is not under chloroform you may make your traction during a pain. Do not be in a hurry, but take plenty of time. As the head descends it will rotate, and the blades should then be taken off and reapplied to the sides of the head.* When the head begins to bulge the perineum, you must deliver very slowly. The handles will now be well forward between the patient's thighs, and you must follow them forwards with the traction rods. Some operators complete the delivery by grasping the traction rod and handles and using the forceps like any ordinary pair, but this is a mistake. The ordinary handles should never be touched during traction. I have seen men deliver by grasping the handles as well as the crossbar while bringing the head through the brim and cavity, but this should never be done. It really destroys the axis-traction action. As soon as the head is born the blades should be removed. Delivery is then completed in the usual way.

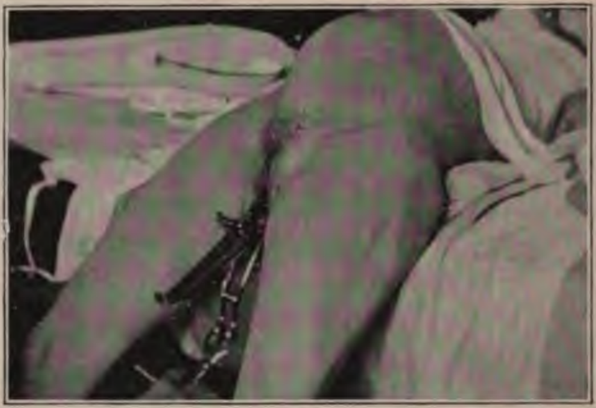

FIG. 61.—FORCEPS DELIVERY IN WALCHER'S POSITION.

The Amount of Force to be used.—In ordinary cases very little force is required, but in contracted pelves, or with large heads, a considerable amount may be necessary. If the instruments hold, any head may be dragged through by main force, but an excessive amount is not justifiable. An expert operator soon learns how much force he may justifiably apply, but he can only learn this by experience. I have frequently delivered live children by exerting my utmost strength with both hands, and my feet braced, but I would not advise a beginner to attempt this. One hand will give all the force required in the majority of cases. By placing the tips of the fingers of the other hand against the head you can judge if any advance is being made. If no advance is being made, after a considerable amount of force is used in the ordinary obstetric position, a trial should be made in the Walcher position, and if you fail then, a symphysiotomy or a craniotomy should be resorted to. Cæsarian section might be done, but the risks would be very great. If the child is dead, craniotomy should be done at once, but if it is alive, symphysiotomy is the operation indicated. I again repeat that under no consideration should version be attempted after failure with forceps.

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* In low forceps cases the head is in the pelvis, and as rotation has occurred, reapplication will not be necessary.

CHAPTER XXXIX

OBSTETRIC OPERATIONS—*Continued*

Induction of Premature Labour—How to decide when to Induce Labour—Methods of Inducing Labour—Preparation of the Patient—The Operation.

Induction of Premature Labour.—Premature labour not infrequently comes on of itself, but there are cases in which it is justifiable to bring it on, either in the interests of the mother or of the child. In the interests of the mother, it may be done in serious diseases of the heart, kidneys, or nervous system, and also in pernicious vomiting. In the interests of the child, it may be done in cases of obstruction from tumours or contraction of the pelvis, and also in cases of habitual death of the fœtus in the later months of pregnancy. It is occasionally done in normal pelves, where the patient's children have such large heads that delivery at full time is fraught with danger.

As the operation is done in the hopes of getting a child born which will survive, it should not be done before the child has reached a viable age. Generally speaking, the beginning of the seventh month is the earliest time of viability, but occasionally six and a half months' children survive. If the child is much under 3 pounds in weight, the utmost difficulty will be experienced in rearing it. There is a popular belief that a seventh-month child is more likely to live than an eighth-month one, but this is a delusion. The nearer full time the better chance there is of its surviving.

With contracted pelves 2½ inches of a true conjugate is the very lowest limit. A live child may be delivered through this at the seventh month, but if the pelvis is smaller, there is little hope of the child being alive, or surviving, if it is born alive. In all cases below 3 inches the chances for the child are not great, and the mortality among such children, when born alive, is very high, so that it is questionable if induction should be done in pelves below 3 inches. If artificial delivery has to be resorted to, the chances for the child are lessened.

How to decide when to Induce Labour.—In cases done in the interests of the mother, the condition of the patient will generally have to be our guide, but, if possible, the operation should be postponed until she has reached the thirty-second week of pregnancy. In a case like one of uncontrollable vomiting, the mother's interests alone should be considered. The time is judged from the cessation of menstruation, but this is very uncertain, and one is often misled by it, so you must make an estimate of the viability from the size of the fœtus, as made out by palpation. When the pelvis is contracted, the size of the fœtus, especially of the head, is most important. So long as the head is small enough to pass easily, you will be able to push it well into the brim by external pressure, and as soon as you fail to do this easily it is time for the induction. With a contracted pelvis the rule should be to see the patient every week or so after she has entered the seventh month, to test the size of the head relative to the brim, and to induce labour as soon as ever you find the head cannot be pushed well into the pelvis. The method of estimating the size of the head relative to the brim has already been described (see p. 247). An instrument has been devised to measure the head through the abdominal wall, but it is of very little use, as the only diameter of the head you can get is the occipito-frontal one, which, in the majority of cases, you do not want. If you could measure the transverse diameter of the head it would be of great use, but this cannot be done.

The following case illustrates the importance of watching a case and carefully testing the size of the head relative to the size of the brim :

CASE.—A primipara was placed under my care when she was about six months pregnant. I found she had a flat pelvis with a true conjugate of 2¾ inches. I came to no decision as to what I would ultimately do, but determined to watch the case closely. The patient came for examination from time to time, and I found that the head would enter the brim up to full time. The labour ended naturally, the head passing the brim with an anterior parietal presentation. The head was very narrow, with a biparietal diameter of 2½ inches, and the bitemporal only 2 inches, so it passed through the 2¾-inch conjugate without difficulty. The head had developed in the best possible shape to overcome the difficulty of delivery.

In cases of habitual death of the fœtus in the later months of pregnancy, about a fortnight prior to the time at which death had occurred on former occasions should be selected, provided this will give a viable child. The results in these cases are so discouraging that for my part

I prefer trying to carry the woman to full time by keeping her on chlorate of potash.

Prognosis.—If the woman is in good health, sepsis is the chief risk she has to run, and one should be able to guard against that by using strictly aseptic methods. When the induction is undertaken because of disease on the part of the mother, the risk is very great, as, unfortunately, the operation is usually only undertaken as a last resort. As regards the child, it has many risks to run. It may be too premature to survive. If the labour has to be terminated by forceps or version, its chances will be lessened, as premature children do not stand artificial delivery well. There is no doubt that in some cases the vitality is lower than in others. In one of my cases induction was done twice for contraction of the pelvis, and the children were born easily without any assistance, and yet in both instances they died in a few days, although they were of a fair size. The third time I refused to induce labour, and did Cæsarian section at full time, and delivered a perfectly healthy child, which did well. For the first month or two the children are very difficult to rear, and they require great attention. If they are under 3 pounds in weight at birth, their chances will not be very great, but 4 to 4½ pound children usually do well.

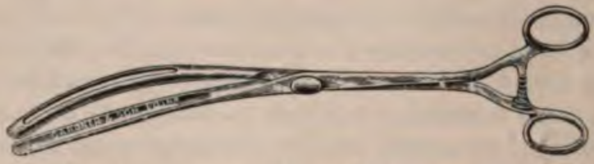

FIG. 62.—FORCEPS FOR INTRODUCING CHAMPETIER DE RIBES' BAG.

Methods of Inducing Labour.—What we wish to do is to start uterine contractions, and to get the uterus to empty itself by natural efforts. The contractions may be brought on in various ways, as by rupturing the membranes, injecting fluids such as water or glycerine between the membranes and the uterine wall, by passing bougies, by plugging the cervix and vagina with strips of gauze, or by using hydrostatic dilators. In some cases where immediate delivery is called for, the cervix may be dilated by means of Hegar's dilators and Champetier de Ribes' bag, Bossi's dilator, or manually incising it if necessary, but such a case is not usually considered an ordinary induction.

Of all the methods the most useful is the bougie one. Rupturing of the membranes is not advisable, as the child will suffer from pressure and probably be still-born. The injection of glycerine was strongly advocated at one time, but it is not by any means devoid of danger. Barnes' bags are very useful when the cervix is partially dilated, and they may be used after the bougies have been tried for a time. The membranes must, if possible, be kept intact until the os is fully dilated, so as to assist dilatation, and save the child from prolonged pressure.

Bossi's dilator has been used, but I do not consider its use advisable unless the case is one requiring immediate delivery.

Preparation of the Patient.—She should be well bathed several times beforehand. The bowels should be cleared by means of laxative medicine and an enema. It is advisable to shave the external parts, or at all events to clip the hair short, so as to render the external pudenda as aseptic as possible. Only new gum-elastic bougies should be used. Boiling softens them and roughens their surfaces, so it is better to sterilize them by first washing them very carefully with soap and water, and then soaking them for several hours in (1 to 20) carbolic or (1 to 2,000) corrosive sublimate lotion. Several No. 10 or 12 size may be used, or one very large one. Catheters should never be used. For the introduction you should have a duck-bill speculum, a pair of volsellum forceps to draw down and steady the cervix, packing forceps and iodoform or aseptic gauze for a vaginal plug, and if the os is quite closed, a few Hegar's dilators.

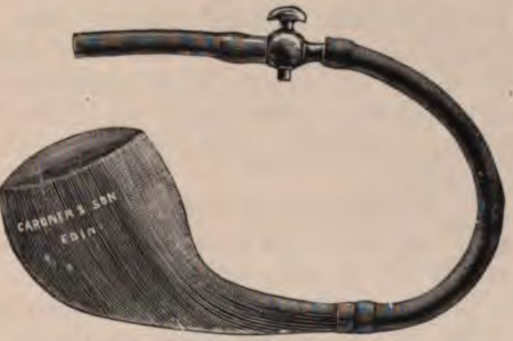

FIG. 63.—CHAMPETIER DE RIBES' BAG.

The Operation.—Chloroform is not necessary, but it is advisable to administer it. With the patient in the lithotomy position, thoroughly cleanse the external parts with lysol solution, and douche the vagina. Pass the speculum, and draw down the cervix, by catching the anterior lip with forceps. If the os will admit a finger, pass it in, and separate the membranes as high up as you can reach. If the os is quite closed, dilate it with Hegar's dilators until it will admit a finger. The bougie should now be passed without touching any of the external parts. It should be gently inserted, and if it meets with an obstruction it should not be forced in, but partially withdrawn and pushed in another direction. The placenta is the usual obstruction it meets with, and it will not do to force the bougie between the placenta and uterine wall, or accidental hæmorrhage will be caused. The bougie should be passed until its end is at the external os. Two or three may be passed in this way. I prefer several to one very large one, as there is less risk of injuring the placenta or rupturing the membranes. There should be very little bleeding. The vagina should again be washed out, and packed with iodoform or aseptic gauze. The vaginal plug prevents the bougies slipping down, and it also assists dilatation. If you should rupture the membranes or injure the placenta, the bougies should be withdrawn and a Barnes' bag inserted, or the cervix and vagina thoroughly plugged. In two of my cases I have met with marginal placenta prævia.

The patient may be allowed to rise, but she is much safer in bed. The pains very rarely come on within a few hours, and it is well to warn the patient that it will probably be some days before the labour is finished. The plug should be taken out of the vagina within twenty-four hours. If the os is not dilating much, the bougies may be taken out, and a new set introduced, or they may be left in twelve hours longer. When the contractions are fairly started the bougies may be removed. If dilatation is very slow you may hasten it by the use of bags, and if the membranes rupture early, a bag should be inserted, to dam back the liqour amnii as much as possible. A natural finish to the labour is preferable, but it must not be allowed to linger too long. The after-treatment of the case is the same as after an ordinary full-time labour.

The child will be feeble, and the greatest care must be taken of it. If it is very small it should be rolled in cotton wadding, instead of being dressed in the usual way. In hospital an incubator is generally at hand to keep it in, at a temperature of about 90° F. In a private house it should be kept in a basket near a fire and with hot-water bottles round it. It should be fed every hour at first, giving it human milk, if possible, from the very first, and if this cannot be obtained very dilute cow's milk with a little cream and sugar added. As soon as it can suck put it to the breast.

The following cases may be taken as examples of induction of labour in contracted pelves. Cases I. and II. are of special interest, as they illustrate the importance of the careful watching of the size of the head relative to the brim. In these two cases the head must have increased in size very rapidly in a short time. From the experience in these two cases I have come to the conclusion that, as the time draws near for induction, one should see the patient every week to judge of the increase in the size of the head.

CASES OF INDUCTION OF LABOUR.

CASE I.—Mrs. G., aged thirty-one, 2-para, was examined under chloroform on January 27. The conjugata vera was estimated to be 3½ inches. The pelvis was generally contracted as well as flattened. The child's head could be easily pushed into the brim. As the patient was only seven months pregnant, and the head could easily be pushed into the brim, it was decided to allow her to go on for another fortnight. Her first labour had been terminated by craniotomy. The patient, unfortunately, did not return at the appointed time, and when labour was induced, one week later than the time set, the head could not be pushed through the brim. Krause's method was adopted, and two sets of bougies were used, but the labour was very slow in coming on, taking fully four days. As the patient was showing some evidence of exhaustion, manual dilation was resorted to when the os was nearly fully dilated, and forceps were applied, but the head could not be got through in the Walcher position. Craniotomy was done The child weighed 5 pounds, minus the brains. If this patient had returned at the time stated, possibly the head would have come through, but I think I made a mistake in allowing her even a fortnight. It would have been safer to have had her back for examination in a week, but the head came down so easily that I concluded she could safely stand a fortnight more. The patient made a good recovery.

CASE II.—Mrs. A., aged twenty-six, 4-para, conjugata vera 3⅛ inches. This patient was admitted to the hospital on September 26, 1904. The pelvic measurements were as follows: intercristal, 9½ inches; interspinous, 9 inches; external conjugate, 6⅕ inches; diagonal conjugate, 3⅞ inches; true conjugate, 3⅛ inches. A fortnight previous to admission the head had easily entered the brim, and she had been told to return in a fortnight. When examined on admission, the head was found to overlap the symphysis considerably, and it could not be pushed into the brim. I had not seen the case previously, but my assistant and resident assured me that they had pushed the head through the brim quite easily at the former visit of the patient. I advised the patient to wait to full time for Cæsarian section, but she would not consent, so we did the induction in the hopes that the head might mould and come through.

The bougies were introduced, and the labour came on next day. The second stage was allowed to go on for five hours, until the head had moulded well. She was then delivered in the Walcher position, with Milne-Murray's axis-traction forceps. The child's heart was beating, but it could not be resuscitated. It weighed 6½ pounds. The head measurements were as follows: biparietal, 3½ inches; bitemporal, 3 inches; suboccipito-bregmatic, 3½ inches. The left eye protruded somewhat, and its cornea showed a marked hazy opacity, with one fairly well-defined band in the vertical axis. The cornea of the right eye had three distinct vertical bands, arranged like barrel staves, and general hazy opacity. The pressure on the left side of the head had been caused by the promontory, while that on the right side had been due to the forceps.

The patient made a good recovery.

Case III.—Mrs. McD., 10-para, aged thirty-three. The obstetric history of this woman is a somewhat remarkable one. Her first three labours were at home, and all the others in the hospital. The first child was born dead, spontaneously, at the seventh month; the second one spontaneously at full time, dead; the third spontaneously at the eight month, also dead; the next five labours were by induction at the eighth month; the fourth and fifth children lived, the sixth died five hours after birth, the seventh was born dead, and the eighth lived five days; the ninth and tenth labours came on spontaneously at the eighth month, and the children both lived. The present labour was the tenth. The conjugata vera was 3¼ inches.

The patient was admitted for induction of labour, but on the day following it came on spontaneously. Two hours after its commencement the membranes ruptured and the cord prolapsed. The os was fully dilated and the pains strong. During the pains the pulsations of the cord could not be detected, but in the intervals they were quite perceptible, but very slow—only 60. An unsuccessful attempt was made to replace the cord with the patient in the knee-elbow position. She was then put deeply under chloroform, and when the uterus relaxed the head was pulled back from the brim by external manipulation through the abdominal wall, and the cord, which was now pulsating strongly, was replaced and the head was pushed well down into the brim. The uterus was then massaged and a firm binder applied. The labour was completed in an hour's time without assistance. The child, a male, was alive, and weighed 6¾ pounds. The patient made a good recovery.

Strictly speaking, one can hardly call this an induction case, but the woman's obstetric history is so interesting that it is worthy of record. Ten labours up to the age of thirty-three is a pretty fair record of itself, but as she has only had one full-time one she has gained at least one month in nine of her pregnancies, which gives her an advantage over ordinary women. I have in several other cases found labour come on spontaneously shortly after the patients have been admitted for induction. The excitement probably has something to do with it.

Case IV.—Mrs. L., 2-para, aged twenty. Conjugata vera 3½ inches. This patient's first labour had been a forceps one, with a dead child. She was eight months pregnant. Two sets of bougies were used, and after two days, as the patient was beginning to show indications of exhaustion, chloroform was administered, the dilatation completed manually, and the delivery effected by forceps. The child, a female, was alive and survived. The mother made a normal recovery.

Case V.—Mrs. G., 3-para, aged twenty-five, conjugata vera 3½ inches. The two previous labours had been very difficult forceps ones at full time, with live children. The deliveries had been so difficult that the patient was advised to have induction about the eighth month. Bougies were inserted, and on the following day a Barnes' bag, which rapidly induced contractions. The child, a male, alive and weighing 5½ pounds, was born by natural efforts. It seemed all right, but on the fifth day it died somewhat suddenly. The mother made a normal recovery.

Case VI.—Mrs. T., aged twenty-five, 3-para, conjugata vera 3¼ inches. The first child was born at full time by forceps, and lived a fortnight; the second one was born by induction, and lived eight months, but then died of diphtheria. On the evening of admission she was prepared for induction, and I intended demonstrating to the students the method of inserting bougies; but during the night labour pains commenced, and in the morning I found the os would admit two fingers, but the pains had ceased, so I introduced the largest Barnes' bag. It was expelled an hour later, and the labour was allowed to go on until the following day, when it was ended by forceps. The child was alive, and weighed 6½ pounds. It did well, and the mother made a normal recovery.

In this case I had seen the patient ten days previous to her admission, and, after a careful estimate of the size of the head relative to the pelvis, had concluded to allow her to go ten days longer. At the first examination the head had not presented, but by external version I had no difficulty in manipulating it round and easily pushing it into the brim.

Case VII.—Mrs. T., 3-para, conjugata vera 3½ inches. This patient had had induction successfully performed twice before. Bougies were inserted for twenty-four hours, and then taken out, and eight hours later labour came on, and the child was born by natural efforts. It weighed 4¾ pounds, and was dead. This patient had been under chloroform for the insertion of the bougies. Before the chloroform was given the child was alive, but no examination for the fœtal heart was afterwards made. The patient, however, was positive that she felt no movements after she became conscious. I remember one other case where the fœtal heart was quite strong before chloroform was given, and yet the child was born dead very shortly afterwards. This was a very easy forceps delivery, and there was certainly nothing in the delivery to have caused the death unless it had been the chloroform. I am inclined to think that chloroform may occasionally cause the death of the fœtus *in utero*, but as yet I have no evidence to offer on this point.

Case VIII.—Mrs. P., 3-para, aged thirty, contracted pelvis, conjugata vera by post-mortem measurement 3⅝ inches. On November 1 bougies were introduced. Some hours later the patient's temperature rose to 99·8° F., and then fell to subnormal. On the 2nd it rapidly rose to 103° F., and the bougies were taken out. The labour soon after ended naturally, but the child was dead. An intra-uterine douche was given, and the temperature quickly fell to normal, but it rose again to 102·8° F. in the evening. After that it kept up about 102° F., and finally rose to 105° F. on the seventh day of the puerperium, when the patient died. Throughout the lochia remained perfectly sweet, and there was nothing to indicate any septic infection.

The post-mortem examination showed that the heart was fatty and enlarged, the right ventricle dilated and thin. The pulmonary orifice was dilated, but all the others were normal. There were ante-mortem clots in all the cavities.

The lungs were emphysematous, but not consolidated in any way. There was no evidence of peritonitis. The lower 5 inches of the ileum appeared to be slightly congested, but on opening it there were no signs of any lesions of the mucous membrane. The uterus was enlarged but its walls were quite healthy. The interior contained some dark red pultaceous material, but this was not septic. The spleen was slightly enlarged, but of normal consistence.

Whatever caused the death, it certainly was not septicæmia. The fatty dilated heart probably failed; but what caused her temperature? I must confess I do not know, neither do I know what caused her child's death. It was not a case of enteric, as the Widal reaction was negative, and there were no intestinal lesions.

CHAPTER XL

OBSTETRIC OPERATIONS—*Continued*

Operations Destructive to the Child—Destructive Operations upon the Head—Instruments—Perforator—Cranioclast—Cephalotribe—Combined Instrument of Auvard—Basilyst—Craniotomy—Perforation—Embryotomy—Evisceration—Spondylotomy—Decapitation.

OPERATIONS DESTRUCTIVE TO THE CHILD.

WITHIN recent years, since Cæsarian section and symphysiotomy have become comparatively safe operations, destructive operations upon the child have gradually lessened in number. Some authorities state that a destructive operation upon a living child is not justifiable, but I cannot agree with them. For instance, cases are occasionally brought into hospital after prolonged efforts have been made to deliver with forceps. The vagina and uterus are already infected, and the operation of Cæsarian section or symphysiotomy would almost assuredly result in sepsis and disaster. The child might be saved but the woman would stand a very small chance of recovery. A destructive operation on the child gives the mother a very much better chance than either of the other operations. This is not theory, but is the result of a large experience. When the child is dead, it goes without saying that it should be broken up if it cannot be delivered entire.

Destructive operations are required in obstructed labours, where neither Cæsarian section nor symphysiotomy is justifiable—*e.g.*, with a dead child, with a live child where frequent futile efforts have been made to deliver, and also in cases where the vagina is very septic. In cases of hydrocephalus and monsters, the mother should not be subjected to any risk in attempting to deliver, so if there is any obstruction a destructive operation should be done at once. I have seen more than one case of rupture of the uterus from the delivery of an unperforated hydrocephalic head.

Destructive Operations upon the Head.—In many cases perforation of the skull and evacuation of the brain, or fluid in a hydrocephalic head, is all that is necessary. In some, the vault of the skull must be crushed, while in others the base also must be dealt with before delivery can be effected.

INSTRUMENTS.

1. **Perforator.**—There are a number of forms of this instrument, but Simpson's is one of the best. The instrument should be sharp at the point, and either quite straight, or slightly curved on the flat.

2. **The Craniotomy Forceps or Cranioclast.**—The instrument consists of two separate blades, united by a lock similar to the British lock of the forceps, or a pivot and slot, and with a fixation screw at the end of the handles. Simpson's instrument, without the fixation screw, is of very little use. The blades should be curved to correspond with the curve of the fœtal head, and the outer blade should be serrated on its concave, and the inner blade on its convex, surface, so arranged that when the instrument is locked the serrations should fit into one another. The outer blade is fenestrated and the inner solid. A long instrument should always be selected, as it gives greater purchase. It may be used to break up the vault and also to make traction.

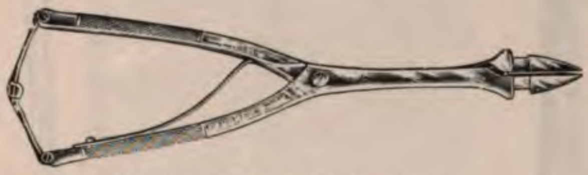

FIG. 64.—SIMPSON'S PERFORATOR.

Cephalotribe.—This is a very powerful instrument for crushing the head. The blades have a slight pelvic curve, but almost no cephalic curve, so that when they are closed there is very little space between them. The lock is the same as that of the forceps, and at the end of the handles there is a powerful screw for closing the blades. The blades are not fenestrated, but grooved and serrated. Braxton Hicks' instrument is the best. It is used to crush the head, and then deliver it by traction.

Combined Instrument of Auvard.—This instrument consists of three blades. The inner one may be pointed for use as a perforator. It is slightly curved and serrated on its convex aspect. On the shank of this blade there are two pivots, one on each side, on which slots in the two outer blades lock. There are also two hinged bars with slots in them, which fit on to pivots on the handles of the two outer blades, to fix them, and at the end there is a hinged screw for closing each blade as it is adjusted. The outer blades may be solid or fenestrated, but should be serrated. The whole instrument is straight, with scarcely any cephalic curve. Auvard's original instrument is too short. I have had it considerably lengthened, and have found it much more useful. Since having this done I have seen

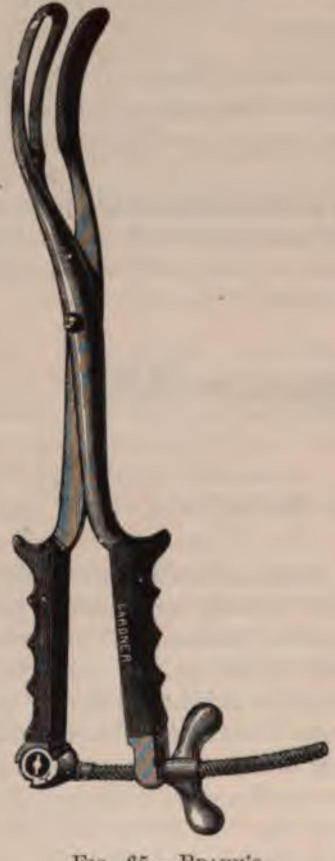

FIG. 65.—BRAUN'S CRANIOCLAST.

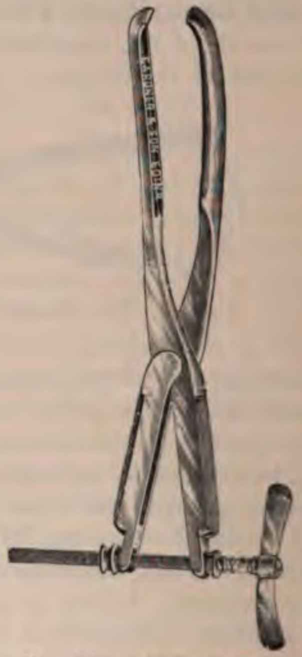

FIG. 66.—CEPHALOTRIBE.

Winter's modification, which is practically the same as mine. The inner blade is passed first, after the brain has been evacuated, then the left one, which should lock behind, and finally the right one, to lock in front. If the outer blades get a good grip they will completely flatten the head, and as the head elongates it will rotate, so as to bring the long diameter into the transverse at the brim. The blades will now lie antero-posteriorly, and as they are straight, they will allow of the flattened head being dragged through the brim. The instrument is a little troublesome to apply, but, after a little practice with it, I have found it the most useful of all in cases of badly-contracted pelvis, and now use nothing else.

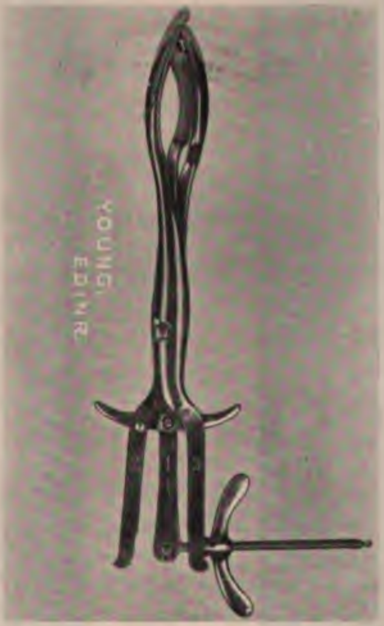

FIG. 67.—AUVARD'S COMBINED INSTRUMENT (AUTHOR'S MODIFICATION).

Basilyst.—This instrument of Professor Simpson's is intended for boring into and breaking up the base of the skull. It is formed into a tractor by adding an outside blade like that of a cranioclast, which is applied to the outside of the head, and thus enables you to deliver. The inner portion consists of two hinged portions which end in a screw. It may be used to perforate the vault with first, but its main use is to break up the base. It is screwed into the base, and then the parts are separated by means of a screw at the end of the handle. After the base is broken up, the outer blade is applied, and screwed up just as in a cranioclast, to enable you to make traction.

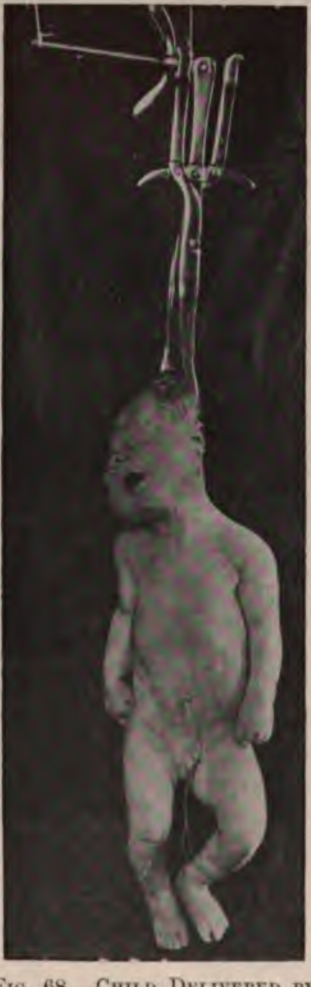

FIG. 68.—CHILD DELIVERED BY THE COMBINED INSTRUMENT.

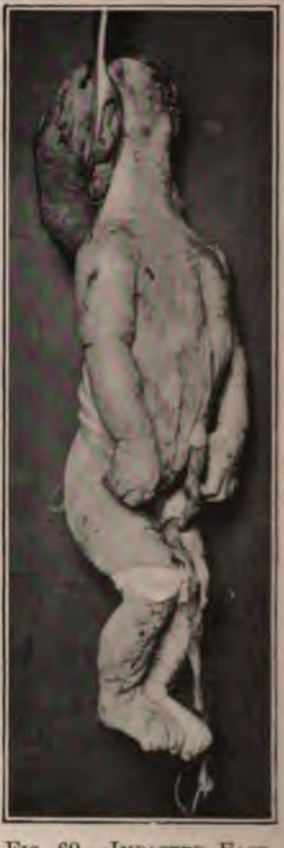

FIG. 69.—IMPACTED FACE CASE DELIVERED BY COMBINED INSTRUMENT.

I have had a fair amount of experience with the newest form of the instrument, which is certainly an improvement on the older forms, but I cannot say it has been as useful as the combined instrument just described.

Several other instruments are useful in operations on the head. A long pair of bone forceps may be used for nipping off any sharp spicules which may protrude through the scalp. A crotchet is used for making traction. For clearing out the brain an ordinary douche nozzle may be used, or a flushing curette.

Craniotomy.—Prepare the patient in the usual way, by cleansing the external parts and scrubbing the vagina out with lysol solution.

Perforation.—The patient may lie on her left side, but it is better to have her in the lithotomy position with the legs well supported. The os must be dilated as fully as possible. Pass the fingers of the left hand into the vagina, until their tips rest against the head. The perforator, which is closed, is grasped in the right hand, and passed along the palm of the left hand, until the point of it comes against the centre of the presenting part of the head. You must carefully guard its sharp edges so as not to cut the vaginal wall while passing it. Press it firmly against the head, first through the scalp and then through the bone, being careful not to allow it to slip. A blunt instrument will be liable to slip, so the point should always be sharp. If the bone is hard, a considerable amount of force may be required. An assistant should keep the head firmly pressed against the brim through the abdominal wall. When the instrument has passed in up to the shoulder, separate the points of it by drawing back the spring and closing the handles. This should be done first in the transverse of the pelvis. Now close the instrument and rotate it, and open it again in the antero-posterior diameter of the pelvis. Close it again, and push it on and break up the base of the brain very thoroughly, so as to kill the child and allow of easy evacuation of the

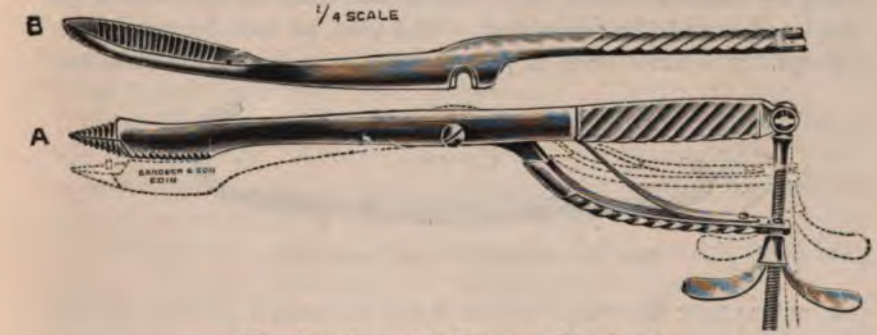

FIG. 70.—SIMPSON'S BASILYST TRACTOR.

A, Inner portion; B, outer blade.

brain. I need hardly say it is important effectually to destroy the child before it is delivered. The tenacity of life is extraordinary. I have seen indications of life in a child where the brain had, apparently, been all removed, and the head had been crushed with the combined instrument. The perforator should be withdrawn closed and carefully guarded. Some operators advise avoiding the sutures or fontanelles in perforating, but this is of little importance. Select the most accessible point. In perforating an after-coming head, behind an ear may be selected, or in some cases under the chin, or through the roof of the mouth.

It is always well to clear the brain out as thoroughly as possible, and this can easily be done with the douche. The ordinary nozzle, a flushing curette, or Bozeman's intra-uterine catheter, may be used.

In many cases delivery can now be effected by forceps, or in breech cases by traction on the body, but in bad cases of obstruction the head will have to be diminished. This may be done by craniotomy forceps. The inner blade is passed into the cavity of the skull and the outer under the scalp, between it and the bone if possible, and the bone is then twisted off, leaving the scalp to prevent sharp edges lacerating the vagina. In many cases the cranioclast is applied at once. The inner blade is passed into the skull and the outer applied over the head, and then locked and screwed up tight. You now make steady traction in the axis of the pelvis, being careful to feel that there are no sharp spicules of bones projecting beyond the scalp. If there are any spicules they must be twisted off, or severe injury may be done to the vagina. The head will tilt and usually come down, but if there is great contraction it is better to crush the head, or break up the base by means of the basilyst.

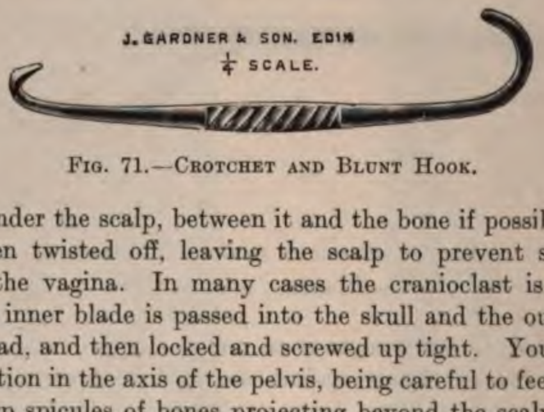

FIG. 71.—CROTCHET AND BLUNT HOOK.

The combined instrument I have found the most useful. After the brain is evacuated, pass the inner blade well in, then pass the left one over the side of the head and lock it behind, and screw it up until the hinged bar can be locked on to its pivot. Next pass the right blade over the other side of the head and lock it on the front pivot. Then swing the screw round and screw the handle home, until the hinged bar can be locked on to its pivot. As the head flattens it will rotate, so that the locked instrument will lie in the conjugate. Traction should now be made in the axis of the pelvis. If a good grip has been got of the head, it will come through with surprising ease. The advantage this instrument has over the ordinary cephalotribe is that it is lighter, and as it is straight it allows of the head rotating, and being delivered with its elongated diameter in the transverse of the brim.

The ordinary cephalotribe is applied to the head just as the blades of the forceps are, and it is then screwed up so as to crush the skull. Delivery is then effected by traction, as with forceps. The crotchet is a useful instrument to make traction with, by hooking it into some part of the skull, only care must be taken to guard against its tearing out and lacerating the maternal parts or the palm of your own hand. It may be used alone, or in combination with any of the other instruments.

Care must be taken to prevent laceration of the vagina by the edges of the bones, but, if the scalp covers them well, there will not be much risk. The fingers of one hand should always be kept against the bones to feel if any sharp point projects.

When the head is delivered there may be some difficulty in getting the chest through. This may be overcome by cutting through one or both clavicles, and if necessary perforating the chest. The clavicles may be cut by means of a pair of long scissors. Cutting the clavicles has recently been advocated in Germany under the name of cleidotomy. The name is the only new thing about the operation.

EMBRYOTOMY.

In impacted transverse cases the body or neck of the child is the part which can be reached and must be attacked. Again, in cases where the chest or abdomen is very much enlarged, either by new growths, dropsy, or gas, a destructive operation will be required.

1. **Evisceration.**—An opening is made into the most accessible part of the abdomen or chest by means of the perforator or a pair of scissors, and the contents removed. If the head is still *in utero*, it should be perforated after the body has been delivered, if it will not come through easily.

2. **Spondylotomy.**—In a transverse case, besides evisceration, it will probably be necessary to cut through the spine to allow of the fœtus being easily doubled up. This may be done with strong scissors.

3. **Decapitation.**—In impacted transverse cases, when the neck is within reach it should be divided. This may be done by means of

a blunt hook or by Ramsbotham's sickle hook. Scissors or an écraseur may be used. The blunt hook is used by twisting, and considerable force will be required. Ramsbotham's hook will cut through the neck quite easily. Care must be taken not to injure the maternal parts in passing it. When it is once fairly round the neck, steady and careful traction should be made, and it will cut through the tissues without difficulty.

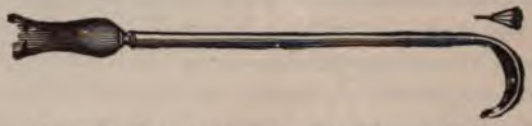

FIG. 72.—RAMSBOTHAM'S DECAPITATING HOOK.

Ramsbotham's hook is a very satisfactory instrument when it is applied, but in contracted pelves there is great difficulty in hooking it round the neck. The blunt hook can be very easily applied, but great force is required to break the neck, and if the lower uterine segment is thinned out, the twisting round of the head may rupture it. I have modified the blunt hook by placing a knife in it (Fig. 74). It is as easily applied as the blunt one, and will cut through the neck as speedily as Ramsbotham's. I have used it frequently, and have found it a much better instrument than Ramsbotham's.

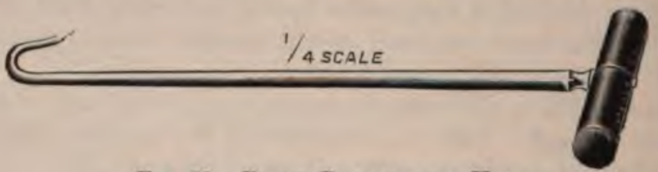

FIG. 73.—BLUNT DECAPITATING HOOK.

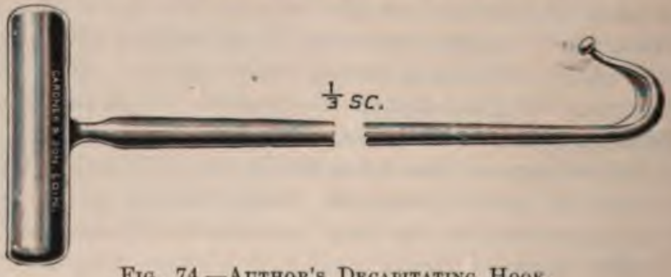

FIG. 74.—AUTHOR'S DECAPITATING HOOK.

After the neck is severed the body can be brought away by traction on the arm. The head must then be delivered by suprapubic pressure, with traction applied by the crotchet or forceps. It may be necessary to perforate it and use the cranioclast.

Except in the case of locked twins, decapitation should never be done after the body is born, as it is sometimes very difficult to deal with the retained head, especially if the pelvis be contracted.

Embryotomy may be a comparatively easy operation, or it may be one of the most difficult imaginable, as the following cases will illustrate :

Case I.—Mrs. M., 13-para, aged forty years, was brought into hospital in a very exhausted condition. Her former labours had always been easy, but her pelvis was slightly contracted. She stated that she was quite sure that she had gone fully a month over full time. We got no history from the medical men who had been attending her, but the friends stated that two doctors had tried for a couple of hours to deliver her, but had failed. One leg was down, the foot protruding at the vulva. We afterwards learned that the attendant had found an anencephalic head presenting, and had turned, but could only get one leg down. With considerable difficulty I got the other leg down, and expected that there would be no more difficulty, but we found no amount of traction would bring the pelvis of the child through. As the two thighs completely filled the vagina, I had to remove one of them to get at the body to break it up. We literally had to break the body bit by bit and remove it, and the head had to be treated in the same way. When we reached the head we discovered the anencephalic condition. It was the most difficult operation I have ever undertaken. The child had evidently been very large. The patient died from shock, and at the post-mortem examination her heart was found so dilated and fatty that it was a wonder she had not died under the anæsthetic. I do not think she would have survived if I had done Cæsarian section, but if I had known what was before me I never would have attempted delivery through the natural passages. If version had not been done, the embryotomy might have been much more easily performed, as the legs so blocked the passage that there was no room to work.

Case II.—Mrs. F., aged thirty-eight, 10-para, was admitted in a very collapsed condition, with a temperature of 97·6° F. and a pulse of 136. The medical man who brought her in stated that he had tried for over an hour to deliver her with forceps and had failed. He had then tried to turn, but had been unable to get the child round. The patient was supposed to have gone beyond full time.

The patient was an extremely stout woman. Her husband stated that she weighed 20 stones. The abdomen was very large. It was impossible to decide whether or not we had to deal with a multiple pregnancy. No fœtal heart could be heard. The external parts were in a very filthy condition from intertrigo. After she was thoroughly scrubbed and douched, a vaginal examination revealed that the head presented, and there was also an arm down and a foot just above the brim. The patient was stimulated with strychnine, and 2 pints of normal saline solution were infused. A mixture of chloroform and ether was administered. I pushed the hand out of the way, and perforated the head. When the brain was washed out a good grip was got with the combined instrument. Strong traction failed to bring the head down, and the instrument pulled away. Repeated attempts broke the head up, but we could not budge the child. It was quite evident it was not the head alone that was obstructing. We next pulled the arm down and brought the neck within reach. I then decapitated with my hook and made strong traction on the arm, and with a crotchet hooked into the shoulder, but only managed to bring the arm away. I found it was impossible to break into the chest, so the foot was brought down and version done. Great traction was applied by means of the leg and a crotchet hooked into the pelvis of the child, but the body would not move. The leg came away. I then broke through the pelvis and eviscerated, and by means of the crotchet removed one half of the pelvis. The other leg was now brought down and part of the body brought away. The chest was next broken into from below, and it and the remains of the head removed. The placenta came away immediately, and there was no post-partum hæmorrhage. The patient's pulse was really stronger than it had been at the commencement of the operation.

The fragments of the child weighed 13 pounds, but that did not represent the whole weight, as all the brains and blood were lost. The woman's pelvis was a normal size, but the soft parts encroached a great deal on the size of the pelvis, and made the manipulations extremely difficult.

The patient's temperature remained practically normal for fourteen days, and then rose to 103° F. The vaginal discharge was very profuse and fœtid. She was douched, and drainage was assisted by raising the upper end of the bed. The uterus did not become infected, and she ultimately made a good recovery.

CHAPTER XLI

OBSTETRIC OPERATIONS—*Continued*

Symphysiotomy—Dangers of the Operation—Indications for the Operation—Preparation of the Patient—The Open Method—Subcutaneous Method.

Cæsarian Section—Time of Operation—Preparations—Instruments—Opening the Abdomen—Uterine Incision—Removal of the Uterus—Porro's Operation—Extirpation of the Uterus—Risks to the Patient in the Ordinary or Modified Operations—Shock—Sepsis—Subsequent Dangers—Post-mortem Cæsarian Section.

SYMPHYSIOTOMY.

THE operation of opening the symphysis was devised by Sigault more than a century ago, but as antiseptics were then unknown, the results, as regards the mothers, was exceedingly bad, and the procedure was abandoned. Within recent years it has been revived, first in Italy and then in France. In Britain it has been done fairly often of late, but it has not been so enthusiastically taken up as on the Continent. With proper care it can be done with a very small mortality, and in suitable cases it certainly should be preferred to craniotomy on a living child. As it does not prevent subsequent child-bearing, it may be done repeatedly on the same patient, but in many cases it has been found that, in subsequent labours, the slight increase in the size of the pelvis and the yielding at the joint will allow of delivery by natural efforts or by means of forceps.

It is a suitable operation with a conjugata vera of not below 3 inches, provided that the head is not disproportionately large. It may be done in a 2¾-inch pelvis if the head is small, but such cases are more suitable for Cæsarian section. Its range of practicability is thus the same as that of induction of labour. Of course, if the case has gone to full time, induction is out of the question, but if the woman is seen in time, and there is a reasonable chance of getting a live child at the eighth month, induction should be preferred.

Dangers of the Operation.—If the bones are too widely separated there is great risk of laceration of the soft parts, including the urethra and bladder, and the bleeding may be very severe from the plexuses of veins, which are usually varicose. Again, the sacro-iliac synchondrosis may be injured and the woman permanently lamed. In some cases the union between the ends of the bones has not been strong enough, and walking has been interfered with. Sepsis is always a very real danger, because, from the situation of the wound, it is difficult to guard against it. The difficulty of nursing the patients is a very great drawback, as no movement can be allowed until union has occurred.

Indications for the Operation.—The child should be alive and the head not much overlapping the symphysis, so that there will be a reasonable chance of getting the child delivered without separating the bones too far. If attempts have been made to deliver by forceps, and the vagina is septic, there will be great risk to the patient. The cervix should be sufficiently dilated to allow of delivery without risk of laceration.

Preparation of the Patient.—The external parts must be shaved and rendered as aseptic as possible. The bladder and rectum should both be thoroughly emptied, and the vagina well douched and cleansed. When the os is dilated sufficiently to allow of delivery, the operation should be done at once.

The Open Method.—Instruments required : A strong, narrow-bladed bistoury, a director, a number of pressure and artery forceps, a bladder sound, large, curved needles and a holder, catgut, silkworm gut, axis-traction forceps, a long strip of rubber plaster.

The patient should lie upon her back. Cut directly down upon the joint, and extend the incision a little above the top of the symphysis, to allow you to separate the parts behind the joint from above. Place a sound in the urethra to keep it to one side. You may now cut down through the joint, taking care to sever all the ligaments, especially the subpubic one. The joint should gape a little, but the bones do not spring apart more than ½ inch. All bleeding-points should be secured with pressure forceps, and tied if necessary. Take the sound out of the urethra and get an assistant to apply forceps to the head. Delivery should be done slowly in the Walcher position. As traction is being made, the pelvic bones should be firmly grasped, to prevent the joint opening too far. The bladder will protrude through the opening. In my first case the bones were separated quite 4 inches, but this is too great an opening. Tearing of the anterior vaginal wall may very easily occur. When the child is born the bladder should be pushed back, and the end of the bones brought as closely together as possible by compressing the pelvis. Stout catgut stitches may be put through the capsule of the joint and periosteum of the bones to keep them together. The soft parts are then closed by silkworm-gut sutures. If there has been any tearing, the bleeding may be very profuse, or, as I have already said, the plexuses of veins are usually varicose. In my third case this occurred, and I had to tie a very large number of bleeding-points, and finally to plug the parts behind the symphysis with a strip of iodoform gauze. To keep the bones in position, apply a broad strip of rubber plaster round the pelvis, and then a firm binder after the superficial wound has been dressed. The patient should lie upon her back, with sandbags at either side to keep her perfectly still. The urine will require to be drawn off at regular intervals. The nursing of these patients is always very troublesome, especially if there has been any tearing of the vagina requiring plugging.

The patient should be kept at perfect rest for about four weeks, to allow of good fibrous union between the ends of the bones.

Subcutaneous Method as described by Herman.

A sharp-pointed tenotomy knife is pressed through the mucous membrane, opposite the middle of the symphysis pubis. When the knife has penetrated the joint, cut downwards, until you reach and divide the ligamentum arcuatum. Then turn the blade and divide the upper half of the joint. When all the fibres are divided the bones will at once spring about ½ inch apart.

Delivery is then effected by forceps, as in the open method, and the subsequent treatment is the same.

This operation seems an exceedingly simple one, but I have had no experience of it. Judging from the difficulty I have experienced in cutting through the symphysis from above, I should say that to do this subcutaneously will not be quite so easy as the description would lead one to suppose. In my first case there was a decided bend in the joint, and to have divided it subcutaneously would have been very difficult, if not impossible.

Ayer's subcutaneous method as practised by Buist differs from this. An incision is made near the clitoris, and a director passed up in front of the joint. A probe-pointed bistoury is now inserted and the joint severed, the urethra being kept out of the way by means of a sound. If there is much bleeding after delivery, the cavity is plugged with a strip of iodoform gauze. Buist has got very good results from this operation. He has performed it twice on the same patient.

I have performed the open operation eight times with success. In the third case the child was lost. Before delivery the fœtal heart was showing signs of failure, and the pressure was too great for the enfeebled child. The first case did not make a quick recovery, as, in spite of repeated warnings, she sat up in bed on the fifth day, and septic infection of the wound occurred. She ultimately recovered, and two years later I delivered her of a full-time 6½-pound child by means of forceps in the Walcher position. The union between the symphysis did not break, and she was able to leave the hospital ten days after delivery. Two years later she again presented herself in labour, but we failed to deliver the child alive, as the brow came down and rectification was impossible. A craniotomy was necessary. In the second case there was very great œdema of the vulva for some days after the operation. In the third, the bleeding was most profuse, and we had to plug the space behind the symphysis. It slowly granulated up and made the convalescence rather long. The child was still-born. All these patients could walk quite well when they left the hospital.

I have also recently delivered by forceps a woman on whom symphysiotomy had been performed in her two previous deliveries. The child was small and came through quite easily.

The following cases illustrate complications which may arise during the performance of the operation :

Case I.—Mrs. B., 1-para, aged twenty-four, was admitted after having been in labour for thirty hours. A midwife had been in attendance all night, and the people stated that she had been most attentive and had examined the patient at every pain. She had ruptured the membranes five hours before the patient was admitted. The os was found to be dilated, and the head presenting but not engaging. It overlapped the symphysis considerably. The conjugata vera measured 3 inches, the interspinous diameter 8¾ inches, and the intercristal 8½ inches, so we had to deal with a generally contracted as well as a flattened pelvis. The case was not a good one for symphysiotomy, but, on the other hand, it was an extremely bad one for Cæsarian section, unless one did a hysterectomy. I therefore decided to do symphysiotomy. After cleansing the vagina as thoroughly as possible, I operated in the usual way, but while dividing the symphysis from above downwards I came upon solid bone about half-way down the joint. I was using a heavy Galbiati's knife, and tried to cut through the obstruction, and in doing so turned the edge a little towards the left side to see if it was merely a bend in the joint, as I had once before found in a case. The bone suddenly yielded, and the joint gaped. I found that the bone had given way into the obturator foramen, and at the same time the left ramus had fractured just about the junction of the ischium and pubis. The child was delivered with forceps. It was a female, alive, and weighed 7½ pounds.

During delivery the fractured end of the ramus caused a laceration into the vagina. The symphysis was brought together in the usual way, and also the fracture. To ensure drainage I plugged the vaginal tear with iodoform gauze. Contrary to my expectations, the patient made a fairly good recovery. There was moderate pyrexia for a few days. The sinus was washed out carefully, and the packing renewed daily for about a week. The patient was dismissed well on the forty-second day. The fracture had united, and there was a fair amount of callus, but nothing excessive. If this woman comes under my care again at full time, I think I shall do a Cæsarian section.

CASE II.—Mrs. M., 3-para, aged thirty. This patient's previous labours had resulted in dead children, the second one being at the seventh month by induction, I think. She was sent in by my colleague, Dr. Munro Kerr. The conjugata vera was 3½ inches. The os was fully dilated.

I operated at once. The child, a female, weighing 8½ pounds, was delivered alive with forceps, the patient being in the Walcher position. There was a good deal of tearing of the soft parts, and the bleeding was very free. I found the distal end of the urethra had torn away from the vagina. I was extremely lucky in getting a catheter into it at once, as it had retracted a considerable distance into the wound, and could not be seen. I pulled it down and stitched it in position again. The symphysis was then closed and the wound firmly plugged with iodoform gauze to check the bleeding. The catheter was tied in and left for three days. After a couple of days the gauze packing was replaced by a drainage-tube. There was some febrile disturbance for a few days, but the recovery was satisfactory.

CÆSARIAN SECTION.

This is a very old operation, but it is only within recent years that it has become comparatively safe for the mother. With proper aseptic precautions it can now be done in suitable cases, with every prospect of success.

Indications for its Performance.—The absolute indications are pelvic deformities and solid tumours of the pelvis, or of any of the pelvic organs, which prevent delivery by the natural passages.

When the passage is narrowed to 2½ inches, or less, there is no chance of getting a live child through, and a craniotomy is very dangerous to the mother. Through a space of 2¾ inches it is possible to deliver a small child alive, but the probability of its surviving is not great. In such a case a craniotomy could be done without very much risk to the mother, but it would, of course, be fatal to the child. The unborn babe has its rights as well as the mother, and they should be considered, though always subordinated to the mother's rights. In many cases, with the conjugate considerably above 2¾ inches, the operation is perfectly justifiable where the head of the child is relatively large. This is especially the case in generally contracted pelves. In such cases a man accustomed to abdominal surgical work would, in all probability, select Cæsarian section when the child was alive and the mother in good condition, while, on the other hand, a general practitioner, unaccustomed to surgical operations, would probably do well to perform craniotomy even on a live child. The conditions under which the operation is justifiable have all been referred to in dealing with obstructed labours. It has been recommended in cases of unavoidable hæmorrhage, and also in eclampsia, but for these conditions alone I do not think it should be done. If they were complicated with a contracted pelvis or a solid tumour, then one might be forced to perform it.

In cases of obstruction from a tumour, one can deal with the tumour, at the same time removing it alone, or along with the uterus. In cases of osteomalacia the disease can be checked by removing the ovaries alone, or the uterus as well. The question of sterilizing the patient arises. This can easily be done by tying the tubes in two places and cutting between the ligatures. Tying the tubes in a single place cannot be depended upon. This will in no way interfere with the menstrual functions, but will effectually prevent future pregnancies. The ovaries may be removed or the entire uterus, but I do not think this should be done merely for the purpose of sterilizing the patient. If the uterus is infected it certainly should be removed, lest the patient die of septicæmia, but in all cases in which the uterus is quite healthy I think it should be left. I cannot agree with Herman that, "except for child-bearing, the uterus is useless; it is liable to disease, and it menstruates, which is a monthly illness." A woman with her internal organs of generation removed is ill-fitted to fulfil her functions in life. The question of sterilization of the patient is a very difficult one to decide in cases of contracted pelves. I have always explained the matter to the patient and the husband, and have invariably found they were both, especially the woman, most anxious to have it done. With a single woman it is, in one way, an even more serious question, because if she knows that she cannot again become pregnant, she may afterwards recklessly follow evil courses. Such cases should be left non-sterilized, unless there is a good reason for preventing future pregnancies.

In future pregnancies there is some risk of spontaneous rupture of the uterus, but this is not very great. I believe the risk of rupture is greater after the fundal than after the ordinary anterior incision. The operation may be performed repeatedly on the same patient, but there would probably be slightly more risk in subsequent operations than in the first.

Time of Operation.—Some operators prefer waiting until the actual labour has begun, but this is not necessary. If possible, the patient should be under observation and preparation a week or so before full time. As soon as the cervix is taken up, and the os will admit a finger, one can select a suitable time, and operate. If labour has come on, the sooner the operation is done the better for the patient, as she will be spared the suffering and exhaustion of prolonged labour. It is better to operate before the membranes have ruptured, and they should never purposely be ruptured beforehand, unless there is over-distention of the uterus.

Preparations.—The patient should be prepared in exactly the same way as for an ordinary abdominal section. The position of the child should be ascertained by abdominal palpation, and one should also make sure that it is alive. The bladder should be emptied and the vagina thoroughly cleansed. Before making the abdominal incision, the skin, which has already been cleansed and sterilized, should be very thoroughly swabbed with turpentine, methylated spirits, and carbolic lotion.

There should be one chief assistant, one for the anæsthetic, one for instruments, one to take the child, and another for the sponges.

Instruments.—A sharp and probe-pointed bistoury, scissors, dissecting forceps, a dozen pressure forceps, a broad director, three dozen long straight needles, threaded two on each uterine suture; two aneurism needles, threaded with sterilized silk, for tying the tubes if necessary; a half-curved needle, threaded with catgut, for stitching the abdominal peritoneum; and silkworm gut sutures for the abdominal wound. For controlling the hæmorrhage during the uterine incision, an ordinary large vulcanite pessary, as recommended by Cameron, is most useful. The uterine sutures may be silk, catgut, or celluloid thread. No matter how well the silk is sterilized, there is great likelihood of it working its way out, either through the abdominal cicatrix, the bladder, or vagina. It may lie quiescent for months, and then give trouble. I have had silk sutures come out upwards of a year after the operation, apparently as fresh as when they were put in. When silk sutures make their way into the bladder, calculi are liable to form on them. Catgut has the advantage that it will be quickly absorbed, but the difficulty of sterilizing it is very great, and if the patient becomes the least septic it will soften at once, and allow the wound to gape. I have now used the celluloid thread on several occasions with excellent results. It is said to absorb, but of this I am not sure. At all events, in none of the cases has it given any trouble.

Sponges made of gauze and thoroughly sterilized are the safest. I use them only once, so about forty are prepared.

Opening the Abdomen.—An incision about 5 inches long is made in the middle line, as high as possible, with about three-quarters of it above the umbilicus. The bleeding-points should be secured with pressure forceps. Then open the peritoneum to the full extent of the wound. The hand should now be passed in to feel how the uterus lies. It will usually be found rotated, so that the middle line does not lie in the centre of the abdominal wound. Straighten the uterus, and place a large sponge at either side of it, to prevent blood or liquor amnii getting into the peritoneal cavity.

Uterine Incision.—This may be made longitudinally in the middle line, as high as possible, so as to avoid the lower uterine segment, or transversely across the top of the fundus. I do not think the transverse fundal incision possesses any advantages over the longitudinal one. Press the pessary down firmly on the uterus, the assistant holding one side while you hold the other, then cut through the wall quickly. If the placenta does not lie beneath, the pessary will allow the incision to be made almost bloodlessly. The membranes will bulge into the incision. Remove the pessary and quickly complete the incision upwards, with a probe-pointed bistoury, for from 4 to 4½ inches. If you have come down on to the placenta you will cut into it, but you do not require to cut through it. Finish your incision in the same way. Now quickly pass your hand into the uterus and grasp a knee or foot, and turn the child out. Some operators advise removing the child head first, but in doing this you will be very likely to tear the lower part of the wound. I have never seen the wound contract and grasp the head. The child can be so quickly turned out that there is no risk of this happening. The incision of the uterus and delivery of the child should occupy only about one minute. If the uterus is firmly retracted round the child considerable force may be required to deliver it. As soon as the child is turned out, the assistant should grasp the uterus and bring it forwards. The placenta and membranes are usually expelled at once, and if they are adherent they must be stripped off. Make sure the uterus is completely emptied. The edges of the wound are now rolled out, and bleeding controlled by the assistant grasping the uterus at each side of the wound between the fingers and thumbs. His right hand will grasp the upper half and his left the lower. An attendant should take the child at once, tie the cord, and get breathing established. Very many of the children are born asphyxiated, and artificial respiration is usually necessary. The deep uterine stitches should at once be passed. Begin at the centre of the incision and pass them from within, including the muscular and peritoneal layer, but not the mucous. With two straight needles on each suture they can be very quickly passed. Place them about ½ inch apart. When they are all passed, sponge the edges of the wound clean, compress the uterus with hot sponges to cause it to contract, and then tie the sutures tight. Some operators advise a superficial layer of sutures for the peritoneum, but this is not necessary, except in a few places where the peritoneum has not come close. Cut the sutures short and compress the uterus between hot sponges if it is not well retracted. If the patient is to be sterilized the tubes should then be tied and cut. The veins in the broad ligaments will generally be found varicose, so care must be taken not to puncture one of them in passing the ligatures. The peritoneal toilet should then be completed, and the abdominal wound closed, by stitching the peritoneal layer with a continuous catgut suture, and silkworm interrupted sutures for the remaining layers. The wall is usually so thin that it is impossible to do it in three layers. The usual dressing is applied and a firm binder. Any clots in the vagina should be cleared out. No drainage-tube of any kind should be placed in the cervix. Neither should the interior of the uterus have been swabbed out unless the membranes or placenta had been adherent. The less the interior of the uterus has been touched the better.

The after-treatment of the patient is exactly the same as after any abdominal section. If she has much pain, she may be given a small dose of morphia hypodermically. The urine should be drawn off in six hours or so, and she should be given sips of hot water from time to time to allay thirst. The bowels should be moved within forty-eight hours by calomel and a saline. If her pulse keeps high the outlook is bad, even although the temperature does not rise much, but if the pulse keeps low you need not be alarmed, even although her temperature should rise two or three degrees. If the first forty-eight hours are passed without any bad indications, and the bowels have been moved, there will probably be no further cause for anxiety. The abdominal stitches should be taken out in ten or twelve days. If the patient is able, she may be allowed to nurse her child. She should be kept in bed for about four weeks, and before she is allowed to rise she should be fitted with an abdominal belt, which she should wear for at least some months. When the uterus is involuted, it will usually be found to be more or less adherent to the back of the abdominal scar.

Removal of the Uterus.—This may be necessary in certain cases, as when there is a tumour of the uterus, fibroid or malignant; when the uterus is infected, as when attempts at delivery have been made by forceps without strict aseptic precautions; and in cases of osteomalacia. Precisely the same operation may be done in cases of rupture of the uterus. I again repeat that, except in cases of osteomalacia, the operation should not be done, unless one feels sure it will lessen the risk for the patient.

Porro's Operation.—The first part of the operation, up to the delivery of the child, is exactly the same as already described, only the abdominal incision should be made principally below the umbilicus. The uterus is then turned out of the abdomen and the cervix secured in the lower angle of the wound by a *serre-nœud* and pins. The uterus is then cut away, the abdominal toilet completed, and the wound closed, leaving the secured stump of the cervix protruding at the lower angle. The part beyond the clamp is killed and sloughs off. It is very difficult to keep it aseptic, and the pressure of the clamp causes considerable discomfort to the patient. A hernia is very apt to form at the lower end of the wound, as this part is naturally weak. When the operation was introduced by Porro in 1876 it undoubtedly lowered the mortality markedly, but the newer method to be described is preferable. Porro's operation has this advantage—that it can be done very quickly, and it does not require any great amount of skill to perform it.

Instead of a *serre-nœud* and pins, two ordinary knitting-needles and an elastic ligature may be used to secure the uterine stump, as recommended by the late Lawson Tait. Equal parts of iodoform and tannic acid make a good dressing for the stump. It should separate in ten or twelve days.

Extirpation of the Uterus.—The uterus and cervix may be entirely removed, but I think it is preferable to leave the cervix, as this strengthens the pelvic floor.

The first part of the operation is the same as for ordinary Cæsarian section, only the abdominal wound should be made as low as possible. When the uterus has been emptied, an elastic ligature should be passed round the cervix, to control the bleeding. Then proceed to ligature the broad ligaments in sections and cut them. One of the ovaries may be left, by ligaturing inside it. When you get well down, incise the uterine peritoneum just above the vesical fold, and strip it down in front and behind. You can now secure the uterine arteries and then amputate the uterus by making a **V**-shaped incision, the point of the **V** being downwards so as to remove a wedge of the cervix. Now stitch the cervical stump with continuous catgut, then cover it with peritoneum by stitching the anterior and posterior layers together over it. The peritoneal toilet is completed and the abdominal wound closed in the usual way.

RISKS TO THE PATIENT IN THE ORDINARY OR MODIFIED OPERATIONS.

During the performance of the operation there is very little risk to the patient. The bleeding is not, as a rule, very great, and it can easily be controlled. Subsequent post-partum hæmorrhage is not likely to occur. If the uterus does not contract well a hypodermic of ergotin may be given. I have four times seen failure of respiration occur, necessitating the performance of artificial respiration. This happened in my first case, just after I had emptied the uterus. Breathing was quickly restored. The other cases were much more alarming. In the first of these the patient's uterus was exceedingly tense, and just as I made my first cut into it the breathing stopped. The arms were quickly raised and depressed, but the patient made no effort to breathe, and I thought she was dead. In the hopes of saving the child I quickly opened the uterus and delivered it, and the mother at once commenced to breathe, and gave no further trouble. The great pressure from the very large tense uterus had apparently interfered with the action of the diaphragm. The child was alive. Cases III. and IV. also gave trouble in the same way.

Shock.—This is never very great, and the patients soon rally from it. If the patient has been long in labour, and her pulse is weak, a pint or two of normal saline solution should be run into the peritoneal cavity before the wound is closed.

Paralysis of the Intestines with Great Abdominal Distention.—On two occasions I have lost patients who suffered from this. In neither case was there any indication of peritonitis found post-mortem. The pathologist could find no other cause of death.

Sepsis.—This is the chief danger, and the strictest aseptic precautions must be taken. If the patient can be properly prepared for the operation for a few days, there should be very little risk. I have never lost a single case where I have had the patient under preparation prior to operating, but unfortunately one cannot always manage this. If the patient has been in labour for some time, and careless examinations have been made, the risk of sepsis occurring is great. In such cases, and especially in those where attempts to deliver have been made, extirpation of the uterus is the safer operation.

Subsequent Dangers.—Intestinal adhesions may give trouble, and even cause obstruction of the bowels. If obstruction comes on, the abdomen should be reopened and the adhesions relieved. If silk sutures are used, they may make their way out through the scar, or through the bladder, or vagina, months afterwards. If a sinus forms, a bloody discharge will come from it at each menstrual period. The sinus will not close permanently until all the sutures come out, and this may take months. As already stated, when the sutures make their way into the bladder, calculi will probably form on them. As, after every abdominal section, the cicatrix may yield and a hernia form, to guard against this the patient should wear an abdominal belt for a considerable time. I lost one of my cases from rather an unusual cause—viz., suppression of urine (see p. 396). So far as I know, this is the only case of the kind recorded.

The following cases of Cæsarian section are given to illustrate some of the difficulties one may meet with:

Case I.—Mrs. C., 6-para, aged thirty-five, conjugata vera normal. Until within eight weeks of the time of admission the patient had not had any symptoms of special significance. From that time on she had been troubled with pretty severe pelvic pain of a radiating character, and a reddish vaginal discharge. During the last week she had had several severe attacks of bleeding, and the doctor who had sent her in said that she had lost about 30 ounces of blood that evening. She was near full time.

On examining her I found she was a very stout woman, somewhat anæmic from the loss of blood. There was no fœtal heart to be heard.

Fœtal movements had ceased for three days. A vaginal examination revealed that there was a large cancerous mass involving both lips of the cervix and extending out on to the vaginal wall, especially on the left side. The greater mass was in the anterior lip. The cervical canal admitted the finger, and the cancer was found to implicate the entire cervix, which was from 2½ to 3 inches in length. The head presented. There was some slight bleeding during examination.

It was quite evident that it was impossible to remove the entire cancerous mass, as it extended too far out on the vaginal wall, but, after considering the case fully, I decided to operate at once and remove the uterus supravaginally, and thus control the hæmorrhage. It might have been possible to have scraped away the cancer to a sufficient extent to have allowed of delivery by craniotomy, but in doing so I was afraid the bleeding might cause the patient's death. As the child was dead there was, of course, no necessity of considering it.

On incising the thick abdominal wall there was no bleeding. I was so struck with this that I thought the patient must have died, but she was breathing well. There was the same bloodlessness in the uterine incision. I left the placenta in the uterus, cutting the cord off short, and as there was no bleeding did not apply clamps or an elastic ligature round the uterus. The cancer had spread upwards into the lower uterine segment, so the amputation incision passed through cancerous tissue. The stump was stitched and the peritoneum closed over it. The pelvic glands, especially on the left side, were deeply involved. The loss of blood was extremely small. A quart of normal saline solution was left in the peritoneal cavity. The child weighed 9½ pounds.

The after-progress of the patient was satisfactory, but during the third and fourth weeks there was feverishness, partly from absorption from the cancerous mass, but also from the sloughing of a burn on the thigh, caused by a hot-water bottle after the operation. The patient suffered no pains in the pelvis, and the cancerous mass shrunk to a certain extent. She went home on the twenty-eighth day, and was still alive two months later, but I am afraid she could not survive much longer.

Case II.—B. S., an unmarried rickety dwarf, aged twenty-three, conjugata vera 1½ inches, was brought into the hospital from the country. She had been in labour for a considerable time, and the cord was prolapsed and quite pulseless. The patient was 3 feet 7½ inches in height, and very markedly deformed, as will be seen from her photograph (see Figs. 75, 76, and 77). The conjugata vera was a little over 1½ inches. Even with a dead child, craniotomy was out of the question, so there was nothing for it but an abdominal section, although the patient was anything but a good subject. As the chances were that the uterus was septic, I determined to amputate it. I operated as soon as she could be prepared. There was very little blood lost during the extraction of the child, and none afterwards, as I at once clamped the uterus low down. The ovaries were both healthy, so I left them. The patient stood the operation well. She had a somewhat febrile recovery, and developed a couple of stitch abscesses, and later on a large abscess under the outer edge of her right breast, which burrowed under the scapula and pointed in the back.

CASE III.—Mrs. P., aged twenty-seven, 2-para, conjugata vera 2½ inches. Just ten months previously this patient had been delivered in the hospital of a 4½ pounds child by craniotomy after a midwife and a doctor had failed to deliver her at her home. She was extremely rickety, with a true conjugate of barely 2½ inches.

When she was about three months pregnant this second time, I saw her and advised her to have Cæsarian section done. She was to have come to the hospital on June 1, but did not turn up; however, on the evening of that day she sent me word that she was having pains. According to her dates the labour was not quite due. I saw her at her home, and found the os was beginning to dilate, so at once sent her into hospital to be prepared for operation. I noticed that she was very stout, but, as she was fully dressed, I did not palpate her abdomen, so did not diagnose twins.

Two hours after admission I operated. Just as I was about to begin the abdominal incision she stopped breathing. The tongue was pulled forward and artificial respiration commenced, but there was no effort at gasping, so I quickly opened the abdomen and cut into the uterus. The placenta was situated anteriorly, and the first sweep of the knife was followed by a large spurt of blood, and the patient at once gave a gasp. The uterine incision was quickly enlarged and a child removed, and I then found there was a second one. Both children, males, required to be resuscitated. They each weighed 4½ pounds, and were so much alike that afterwards nobody could tell which had been born first. If they had been children of aristocratic parents, and had survived, I am afraid there would have been difficulties in settling the point. As it was, the registrar was very indignant that we could not tell which was the elder of the two. I advised the nurse to tell him that, according to Shakespeare, they were never born at all, but were, like Macduff, from the "mother's

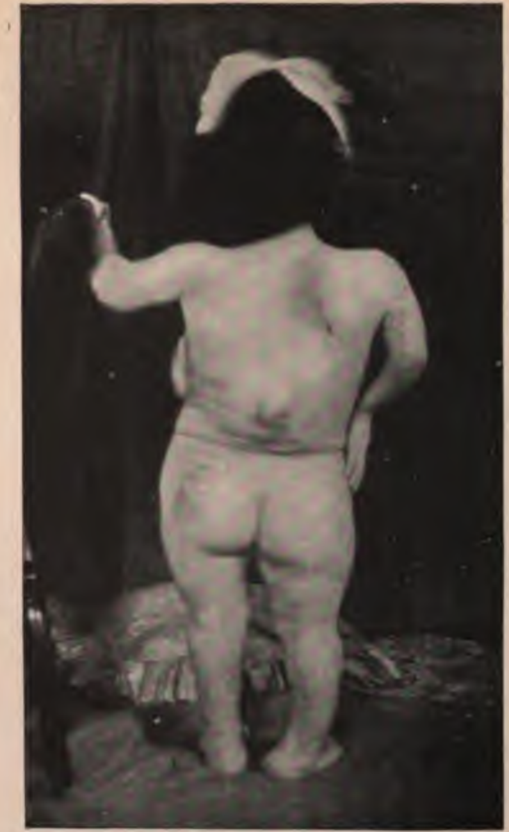

Fig. 75.

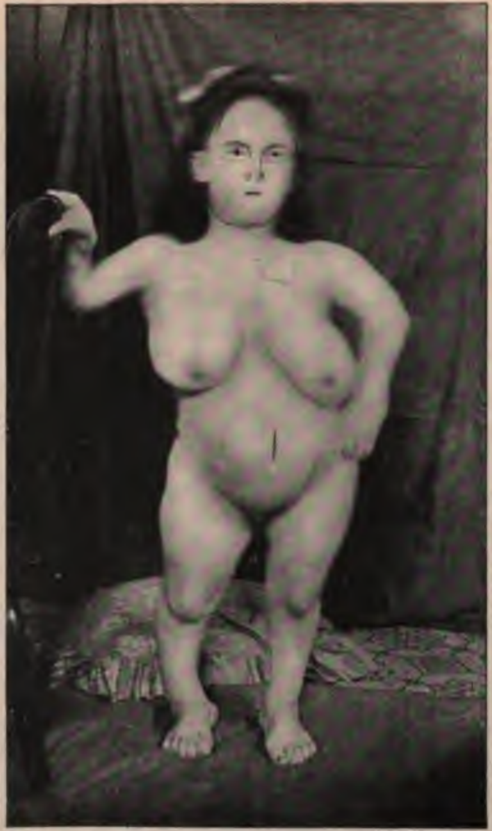

Fig. 76.

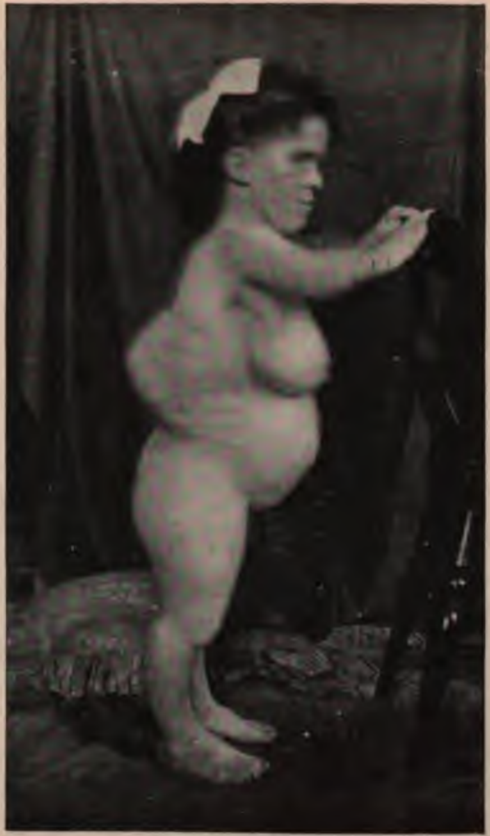

Fig. 77.

From photographs taken before dismissal. The chair she is holding by was 2 feet 9 inches in height.

womb untimely ripped." I do not know how he settled the point.

The patient breathed quite well after the uterus was emptied, and gave no further trouble. The operation was finished in the usual way, and as the woman wished it, I tied and cut her tubes.

The children seemed to thrive for two weeks, and then they suddenly began to pine, and one died on the eighteenth and the other on the twenty-first day.

I had once before had the unpleasant experience of failure of breathing in the patient just as I was beginning the uterine incision, and in Case IV. the same thing happened. In all of these cases the abdomen was very tense. In the first case artificial respiration was kept up for some minutes, and I thought the patient was dead, so quickly opened the uterus to save the child. The mother then breathed at once. In the other cases I did not wait any time, but went on with the operation while the assistants were doing the artificial respiration. The free flow of blood helps the circulation by relieving the engorged heart, and the relief of pressure upon the diaphragm allows of free play to the lungs. In cases of great distention I think it would be advisable to rupture the membranes immediately before beginning the operation.

The patient made an uninterrupted recovery.

Case IV. — Mrs. O., 2-para, aged twenty-five, conjugata vera 2¼ inches. This patient's first labour had ended in a craniotomy. She was very rachitic, being only 4 feet 2 inches in height. Her intercristal and interspinous diameters were the same, 9¾ inches, and the diagonal conjugate 3 inches. She had suffered from chronic bronchitis for many years, and was in the hospital under treatment for this for eleven days before the operation was done. I was anxious to operate upon her during daylight, as I have found that in operating at night with the gas burning right over the table there is a good deal of decomposition of the chloroform, which causes bronchial irritation. On examining her on a Friday, I found the os was patent, although there had been no pains, so I had her prepared for operation on the Saturday morning. During the night the pains came on. On the Saturday morning there was, unfortunately, a very dense fog, but as labour had commenced I was forced to proceed with the operation under the worst possible conditions for the patient. She took the chloroform badly, and just as I began the abdominal incision she stopped breathing and seemed to be dead. The tongue was pulled forward and artificial respiration begun while I went on with the operation. As soon as the uterus was opened breathing commenced, and we had no further trouble. Her tubes were tied and cut. The bronchitis was bad for several days, but otherwise the recovery was uneventful. Her baby, a girl, weighed 7¼ pounds, and she was able to nurse it.

CASE V. — Mrs. H., 5-para, aged thirty-five, conjugata vera 2¾ inches. This patient's first child had been born at full time, dead, either by forceps or craniotomy; her second, at full time, dead, a breech, craniotomy on aftercoming head; her third at the seventh month, dead, by forceps; and her fourth at full time by craniotomy. With such an obstetric history it was time for a Cæsarian section. Labour commenced on the day following admission. The operation was done as soon as possible after the pains commenced, but the membranes ruptured about an hour before I began. The only point to be noted about the operation was that the membranes were extremely adherent. To get them cleared off, I inverted the uterus through the wound. The upper half of the abdominal incision was protected by a large gauze swab between it and the uterus. The report says the tubes were not tied, but I have an impression they were. The child, a boy, weighing 9¾ pounds, was alive. Three hours after his birth pus was observed to be streaming from one of his eyes, although a 2 per cent. silver nitrate solution had been instilled. It was a very typical case of ophthalmia neonatorum, and the infection must have occurred *in utero*. When I discovered this I had grave doubts of the mother's recovery, and was not astonished to find her temperature rise to 101·2° F. It remained about that height for five days, and then gradually came down to normal. There was a great deal of abdominal distention. On the sixth day I washed out the uterus and dressed the abdominal wound. The wound seemed to be healing nicely, and there was no redness with any of the stitches. Two days later some discharge was found at the edge of the dressing, and on removing it the lower half of the wound was found to be sloughing very badly. The stitches were all removed and a wet dressing applied. The patient's temperature was now normal. On examining the parts carefully next day I found the upper half of the wound healed, but the lower half gaping fully an inch wide and sloughing badly. Towards the left a sinus ran downwards and outwards for quite 3 inches. There was also some undermining at the lower edge of the wound. The floor of the cavity was formed by the anterior uterine wall, and the catgut sutures were still present. The uterine incision was firmly healed. The portion of the abdominal incision which had sloughed exactly corresponded with the part which the inverted uterus had come in contact with. When the slough had separated I dressed the part with strips of iodoform gauze plugging steeped in Hey's wash. The parts soon took on a healthy action and gradually closed, but it took two months before this was completed. The patient was very well when she left the hospital, and her temperature was never above normal after the stitches had been taken out. The ophthalmia subsided after a few days' treatment, and the baby throve well.

The whole of the anterior wall of the uterus was firmly adherent to the abdominal wall. If she should require another section it can easily be done extraperitoneally.

CASE VI.—Mrs. A., aged twenty-six, 3-para, conjugata vera 2¾ inches. This patient's two previous children had been delivered dead, by craniotomy, I think. Both she and her husband were anxious that I should sterilize her, if the baby was alive and healthy. The child, a boy, weighed 8 pounds, and to all appearances was a splendid specimen. Several of the men present at the operation remarked this. I therefore tied and cut the tubes. The patient made a perfectly normal recovery. On the second day the baby became intensely jaundiced, and died on the following day. A post-mortem examination did not reveal anything except that all the organs were bile-stained and the liver was enlarged.

In this case I had intended to leave the tubes patent, if the patient and her husband had not both requested me to sterilize if the baby was alive and healthy. The loss of the child was a severe blow to them, but nobody could have foreseen such a result.

CASE VII.—Mrs. McC., 2-para, aged twenty-seven, conjugata vera 2¼ inches, full time, was admitted to the hospital suffering from antepartum hæmorrhage. She was of small stature, and markedly rachitic. Her pulse was about 120 and feeble, and her lips and conjunctivæ were very pale. A vaginal examination revealed that the canal was full of clots, and that a considerable amount of blood was flowing from the os, which would admit one finger. No placenta could be felt, nor any bogginess in the fornices. Accidental hæmorrhage was diagnosed. The conjugata vera was estimated to be 2¼ inches. The head presented, but was quite free above the brim. Palpation revealed that the abdomen was very large. The fœtal parts could be felt, and the head overlapped the brim markedly. Nothing like clots could be detected in the uterus, but the marked distention led us to suspect that we might have concealed as well as external hæmorrhage. The fœtal heart was audible to the left and below the umbilicus.

On fully considering the case I concluded that a Cæsarian section would give the woman the best chance. She was so collapsed that I was quite sure she would not survive a craniotomy. She was in a very dirty state, but the abdomen was cleansed as thoroughly as possible. I decided that, if there was much clot in the uterus, I would do a supravaginal amputation.

The operation was done in the usual way. The child was alive. The placenta had been only partly separated, and there were several clots behind it. The uterus retracted well, so I decided to leave it. Both tubes were tied and cut. Before closing the abdomen a quart of normal saline solution was run into the peritoneal cavity. The patient was freely stimulated.

The after-progress was most satisfactory. For two days the temperature was 100° F., and after that it remained normal. The wound healed well, except for the formation of one small stitch abscess.

Case VIII. — Mrs. C., 2-para, aged twenty-five, conjugata vera $3\frac{1}{8}$ inches. This patient's first delivery had been by craniotomy. When admitted the os was fully dilated. The head presented, but overlapped the symphysis, and would not engage. As the child was alive I advised Cæsarian section.

The patient's bowels moved very copiously when she was put under chloroform, and the odour was very offensive. The placenta was on the anterior wall of the uterus. The child, a female, was alive. The tubes were tied and cut. There was an accessory tube on one side, which I removed.

The patient was somewhat collapsed, but quickly rallied. On the second day the temperature reached its highest point—99·8° F. The pulse kept over 120, and the abdomen became distended. There was considerable restlessness, and some pain in the abdomen. The bowels were very obstinate, and could not be got to move by calomel and a saline or an enema.

The distention of the abdomen became very extreme, in spite of all our efforts to relieve it. On the fourth day the bowels moved frequently. The patient was now extremely restless, and struggled violently at times. There seemed to be complete paralysis of the bowels. On the fifth day she became very collapsed and cold. I removed the two lower stitches from the abdominal wound and separated the edges. There was absolutely no indication of peritonitis. Saline solution was run into the abdomen, but there was no reaction. The patient died that day.

The post-mortem examination revealed nothing to account for her death. There was no indication of any peritonitis. The intestines, especially the small ones, were very distended, but the peritoneal coats were quite normal. The pathologist could throw no light on the cause of death beyond paralysis of the intestines. I have had a second case exactly similar, except that there was no excessive diarrhœa. In this second case there was absolutely no indication of peritonitis.

Case IX.—M. D., 1-para, aged twenty-three, conjugata vera 2¾ inches, came for advice when she was about seven months pregnant. She was not in labour. Her external measurements were: intercristal diameter, 10½ inches; interspinous, 10 inches; and external conjugate, 7¼ inches. The diagonal conjugate was barely 3½ inches, so the true conjugate was about 2¾ inches. She was taken into the hospital for a few days. When examining her we found there was a cystic swelling in the right lateral fornix bulging somewhat forwards. A careful investigation of this swelling revealed that it was a portion of the bladder.

The patient returned at the commencement of labour, and the section was performed a few hours later. There was a very small fibroma connected with one of the ovaries, and this was removed. The child, a female, was alive. Its head was very much moulded. As the membranes were not ruptured, and the patient had not been long in labour, the head must have developed in that shape.

For five days the patient's condition was quite satisfactory, but on the sixth day the temperature rose and the lochial discharge became fœtid. A vaginal douche was given. Next morning about 4 a.m., without any warning, the patient suddenly collapsed. Her face became drawn and pinched, and a cold sweat broke out all over the body. Her pulse was scarcely perceptible. She was violently sick, and vomited a considerable amount of bile-stained fluid. There was no distention of the abdomen, but there was dulness and some tenderness towards the right side low down. The uterus was somewhat to the left of the middle line in position. This dull area was in the region where the bladder had been before delivery. A vaginal examination revealed nothing in the broad ligaments. An intra-uterine douche was given, but nothing was washed out of the uterus. The patient was stimulated most freely by means of strychnine, digitalin, ether, brandy, and champagne, and she was surrounded by hot-water bottles. Nutrient enemata were also given. For about twenty-four hours there was practically no response to the stimulation, and to complicate matters no urine was excreted. She was given an intravenous saline transfusion of 2 pints. Immediately after the transfusion the pulse began to improve, and within a few hours she passed urine. There was now a marked change in her condition. The improvement continued.

The vaginal discharge was fœtid, but the uterus was not affected. About a week later the temperature rose again, and we discovered there was an abscess at the lower edge of the wound which led down to the uterus. It was opened, and soon healed. The catgut used at the operation was very friable, and may have been infected. This abscess had nothing to do with her collapse. Her recovery was slow.

I had entirely given up all hopes of saving this patient. The effect of the saline transfusion was most marked. When we began the transfusion the radial pulse was barely perceptible, but before we finished it was of fair volume, and the beats could be quite easily counted.

Vaginal Cæsarian Section.—This operation was devised by Dührssen, but I have had no personal experience of it. It is, of course, only applicable to cases in which there is no, or only very slight, contraction of the pelvis. It will, therefore, be very seldom required.

Method of Operating.—The vagina is thoroughly cleansed, the perineum drawn back with a broad-bladed speculum, and the cervix drawn down by forceps. The anterior vaginal wall is next separated from the cervix by a transverse incision, and the bladder and parts in front raised up, and the cervix split in the middle line up to the internal os. The next step is to unite the cervix and vaginal wall by means of catgut, and then continue the incision upwards into the lower uterine segment. The membranes now protrude. The speculum is withdrawn, and the child delivered, usually by podalic version. If the head is grasped it may be necessary to split the anterior uterine wall further. After delivery of the child the placenta and membranes are removed, the uterine cavity plugged with iodoform gauze ; the uterine incision is closed with about half a dozen catgut sutures, but the vaginal portion of the cervix should not be stitched for fear of subsequent cicatricial contraction.

The bladder may easily be injured, and, if it is opened into, the tear should be closed at once by catgut sutures.

Post-mortem Cæsarian Section.—If a pregnant woman dies undelivered, the fœtus may live for as long as twenty-five minutes after the mother. When the mother dies of disease there is not much chance of the fœtus being alive, but in all cases of sudden death from an injury, burn, etc., which does not affect the uterus, the fœtus should be delivered by opening the abdomen as soon as the mother is dead.

CHAPTER XLII

ACCIDENTS TO THE CHILD DURING DELIVERY

Asphyxia Neonatorum — Asphyxia Livida — Asphyxia Pallida — Intra-uterine Fractures: Case—Fracture of the Skull during Delivery: Cases—Fracture of the Long Bones—Fracture of the Clavicle—Fracture of the Humerus—Injuries to the Soft Parts—Opacity of the Cornea: Case—Pressure upon Nerves—Hæmorrhage into the Brain or its Membranes: Cases—Cephalhæmatoma.

Asphyxia Neonatorum.—The sudden change of the fœtus from the warmth of the interior of the uterus to the comparative coldness of the air—*i.e.*, from a temperature of nearly 100° F. to one of 60° or 70° F.—acts as a powerful reflex stimulus to all the muscles of the body, including those of respiration, and the child quickly gasps for breath, struggles, and cries. The placental circulation is at the same time cut off, and the accumulation of CO_2 in the blood stimulates the respiratory centre. If the accumulated CO_2 is allowed to act too long, it paralyzes instead of stimulating respiration. Death will therefore follow, if breathing is not very soon established. The Eustachian valve should close the foramen ovale, as soon as the lungs begin to expand and exert their aspirating power upon the blood in the heart. The adult circulation is thus established between the right and left side of the heart through the lungs.

As a rule, the child gasps and cries as soon as it is born, but in many cases there is more or less asphyxia. Asphyxia may arise from interference with the placental circulation, as from detachment of the placenta, pressure upon the placenta, or upon the cord, by the latter being prolapsed or wound round the neck or body, or by its being caught between the head and the blade of the forceps. Knotting of the cord, or syphilitic disease of the umbilical vessels, would also interfere with the circulation, by narrowing the lumen of the vessels. When the body is born breech first, the stimulating effect of the air upon the body may reflexly cause the child to attempt to gasp while the head is still in the passage, and it will draw mucus into its air-passages, which will prevent air entering after the birth is completed. Children delivered by Cæsarian section seldom breathe at once. I think the explanation of this is that the opening of the abdomen suddenly exposes the anterior surface of the uterus to a temperature about 30° F. lower than it was before, and this sudden fall in the temperature causes the child to gasp, and fill its air-passages with liquor amnii. In one case I saw, this had evidently happened, as breathing could only be established after the child had been inverted, and several ounces of fluid emptied from its lungs. Prolonged or severe pressure upon the head during delivery may cause asphyxia by paralyzing the centre in the brain. It may arise from an abnormality in the child, such as a patent foramen ovale or atresia of the pulmonary artery, which prevents the blood passing into the lung. An enlarged thyroid or thymus, by direct pressure upon the trachea, would also cause it. If the child were expelled with the membranes unruptured, or with a caul completely covering the head, it would be asphyxiated, if the membranes were not speedily ruptured. A perfectly strong child might easily be asphyxiated, even after breathing has been established, if it were carelessly placed so that its mouth pressed against the bedclothes or pillow. Among the lower classes the lives of many children are lost in this way by "overlaying," as it is called. It is too often the result of drink, the intoxicated mother either lying on her child, or so closely pressing it to her side as to smother it.

Asphyxia neonatorum is usually divided into two varieties :

1. **Asphyxia Livida.**—The child is livid in colour from accumulation of CO_2 in the blood. The heart is beating strongly, and the reflexes are present. You may see this typically when the cord has been round the neck. The prognosis is favourable.

2. **Asphyxia Pallida.**—The child is limp and pallid. The heart is beating feebly and slowly, and the reflexes are quite abolished. The prognosis is unfavourable.

Treatment.—In every case, as soon as the child is born, its nostrils and mouth should be cleared of mucus. A convenient way to do this is to lift it by the feet and insert a finger into its mouth. A smart slap or two on the buttocks will cause it to gasp and cry, under ordinary circumstances. In a case of asphyxia livida cut the cord at once, and, before tying it, allow a few drachms of blood to escape, then proceed to do artificial respiration. Combined with artificial respiration you may use alternate hot and cold baths. Any, or several, of the different methods of performing artificial respiration—viz., Sylvester's, Marshall Hall's, or compressing and expanding the chest by doubling up the infant and then straightening it out, may be tried. Schultze's method is about the best. Grasp the infant in your hands, so that your two palms lie on its back and your thumbs over the top of the clavicles, against the front of its chest. The back of its head should lie between your wrists, which support it. See that your hands are not slippery, and that you have a good firm grip, so that there will be no danger of the child flying out of your hands when you swing it. It is well, also, to see that there is no meconium escaping, or you may bespatter your own face. The first movement is to invert the child, and compress its chest with your thumbs, to expel the mucus from the passages. Then swing the body downwards, and this movement will expand the chest, and cause air to enter, even although the child should be dead. Then swing the body back and compress the chest again to expel the air from it, and repeat the downward movement again, and so on until the child breathes naturally. The movements should not be done too quickly. About fifteen times per minute is fast enough. As I have already mentioned, the heavy liver drags so much on its suspensory ligament during the downward swing of the child that it may cause a hæmorrhage into the capsule of the organ.

Direct inflation of the lungs through a catheter passed into the trachea is sometimes done, but it is not easy to pass a catheter through the narrow glottis. An easier method is by blowing into the child's mouth, closing the nostrils with the finger and thumb of one hand, and compressing the stomach with the other hand. A clean handkerchief should be placed over the child's mouth, then take a deep inspiration and blow the first part of the expiration into the mouth through it.

Traction upon the tongue is useful in some cases. A favourite proceeding among elderly women is to rub the child's chest with spirits. A little may be rubbed inside the gums. The best form of stimulant is a hypodermic injection of strychnine, using not more than $\frac{1}{150}$ grain. It stimulates the heart and also the respiratory centre, so is most useful in asphyxia pallida. Care must be taken not to give too large a dose. I have known $\frac{1}{30}$ grain given by mistake cause convulsions. It certainly made the child breathe, but an enema of chloral had to be given to stop the convulsions. The child did well subsequently, but the convulsions were rather alarming.

Asphyxia Pallida is a much more difficult condition to deal with. If the cord is pulsating, do not cut it at once. Invert the child and clear its air-passages, and rub it briskly. Then tie and cut the cord. Put the child into a hot bath, and then do artificial respiration by the Schultze method. In these cases use strychnine.

One should persevere with artificial respiration so long as the heart is beating, but when the heart has once stopped nothing will do any good. In cases of asphyxia livida the cord may be untied and a few drachms of blood allowed to flow out, so as to relieve the engorgement of the heart.

After breathing is established the child must be kept very warm, and loosely wrapped up, to allow of a free play of the chest wall. If it is weakly it should be given 4 or 5 drops of brandy in water every few hours.

Intra-uterine Fractures occasionally occur, but in the majority of cases fractures are caused during delivery. The bones of the legs, arms, and shoulder girdle are those which most frequently suffer from fracture or dislocation, but the cervical spine is sometimes dislocated in delivering an after-coming head. The lower jaw, too, is occasionally dislocated or fractured in the same method of delivery.

Case of Intra-uterine Fracture of the Skull.—Mrs. G., 8-para, aged thirty-five, full time. On September 3 the patient slipped and fell on her back while hanging up clothes. She fell on a stool, which struck her on the right lumbar region behind. She felt sick and faint. After this the fœtal movements were less frequently felt. She volunteered the statement that it was only when turning from side to side she felt any movement. On September 7 labour pains commenced, and at 10 a.m. the membranes ruptured, and a lot of dark, tarry blood escaped.

On admission, about six hours later, the breech was felt well engaged in the pelvis. The back of the child lay to the front on the right side. On palpating the head at the fundus it was felt to be peculiar, but the exact condition could not be made out. The breech was born naturally. The after-coming head came away without difficulty. A considerable amount of dark clot and the placenta came away with the child. The child, a male, weighed 9 pounds, and was quite dead. There was no maceration. Over the region of the right parietal bone a spoon-shaped depression was noticed, and at the lower edge of the parietal a ridge was felt that suggested a fracture.

Post-mortem examination report by Dr. Carstairs Douglas :

" The head appeared well formed. An external examination revealed what seemed to be a fracture in the lower part of the right parietal bone, placed horizontally about 1 inch above the tip of the lobe of the right ear, and a little anterior to the same. A sharp ridge of bone could be felt here. Above it a depression could be made out on the right parietal bone. On reflecting the scalp a small hæmorrhage was found on the anterior portion of the right parietal, and another posteriorly near its inferior angle. A very distinct roughly triangular pit, about 1 inch in its largest diameter, and about $\frac{3}{16}$ inch deep at its deepest part, was seen on the parietal about 1 inch above the union of the latter with the squamous and $\frac{1}{3}$ inch behind the coronal suture. The skull was not broken here either inside or out. Below this was a semilunar cleft, the concavity downwards, about $\frac{3}{4}$ inch in length, and deepest in the centre, where there was only dura. Examination of this showed it to be a separation at the suture between the inferior margin of the parietal bones and the squamous part of the temporal, the latter being easily depressed below the sharper harder margin of the former. It was this that had given rise to the idea of fracture on external examination.

"On opening the skull the dura and pia were found engorged. There were several extravasations of blood, viz., between the lobes of the cerebrum, over the tentorium, and in larger amount in the base of the skull, especially in the middle fossæ. The brain tissue itself was not lacerated.

"The examination of the inner aspect of the right parietal and squamous bones, removed in a piece, showed the bulging inwards of the spoon-shaped depression, but without any lesion of the internal table ; while at the sutural separation below this, although the bones gaped, the dura stretched between them intact."

Fracture of the Skull during Delivery.—In dealing with obstructed labours, I have already mentioned depressed fractures of the skull from the pressure of the promontory. This may occur when delivery is effected by nature, but is much more liable in difficult artificial deliveries. The position of the depression varies, but it is usually in the anterior part of the parietal bone, or on the frontal. If it is on the frontal the eye of that side will be bulged forward, and there may be hæmorrhage into the back of the orbit. In the ordinary spoon-shaped depression the bone is merely bent in or depressed, and it can usually be raised by applying pressure obliquely to the head, as suggested by Dr. Munro Kerr. If the bone is fractured, however, you cannot raise it in this way. When there is an actual fracture the brain may be lacerated, and there be considerable hæmorrhage. In some cases you find marked hæmorrhage without any actual fracture.

Prognosis.—If there is an actual fracture with hæmorrhage, with or without a brain lesion, the child will probably die within a few hours or days. When there is only a depression, even although it be a marked one, the child will probably live, but if the depression does not rise, there is great risk of imbecility or epilepsy developing.

Treatment.—The ordinary spoon-shaped depression, if it is left alone, usually rises of itself after a short time, but more or less permanent depression may be left. In all cases, pressure should at once be applied obliquely to the head, and in some cases the depression will thereupon disappear. If it does not disappear, an incision should be made, with aseptic precautions, down to the dura mater near the edge of the bone, and a probe or periosteum elevator introduced, between the dura and bone, to lever up the depression. The opening through the bone should not be made at the suture, because the dura is adherent there, and you wish to avoid injuring it.

CASE I.—*Fracture of the Left Frontal Bone with Laceration of the Brain and Hæmorrhage.*—The mother's pelvis was contracted, the diagonal conjugate being 3¾ inches, giving a true conjugate of about 3 inches. This was her third confinement, the other two having been instrumental ones. The first child was still-born, the second alive and still surviving. This time delivery was effected by axis-traction forceps, in the Walcher position, without much difficulty, after a short trial in the ordinary left-side posture.

The child, which weighed 6¾ pounds, breathed at once, and seemed all right, except that it was restless. There was a small hæmatoma of the scalp. There was no depression of the skull. About seventeen hours after delivery it was supposed to be sleeping, but was found to be dead.

At the post-mortem a comminuted fracture of the left frontal bone was found, with laceration of the brain and cerebral hæmorrhage in that region. There was also some hæmorrhage into the scalp. The fracture had been caused by the pressure of the promontory, and not by the blade of the forceps.

CASE II.—*Fracture of the Left Frontal Bone with Hæmorrhage.*—In this case the child was delivered with axis-traction forceps through a pelvis with a true conjugate of 3¾ inches. At birth there were no signs of respiration, but the heart beat for five minutes.

A post-mortem examination of the head made by Dr. Carstairs Douglas revealed "a considerable lateral compression, the right parietal bone overriding the left. Dark blue depressed marks (due to forceps) were seen on both frontal bones and behind the left ear. There was a large caput over the posterior fontanelle. On reflecting the scalp the tissues were found to be very œdematous. Slight hæmorrhages lay over the frontal bones. A complete fissured fracture was found in the lower part of the left frontal, about ⅓ inch above the orbital plate, running out horizontally to the coronal suture. Inside the skull there were small hæmorrhages opposite the points of application of the forceps, as well as an effusion of dark, venous blood, of moderate size, lying over the tentorium on both sides."

CASE III.—*Deep Depression of the Left Frontal Bone treated by Incision and Elevation.*—The mother of the child was a small, rickety woman. She said that she did not walk until she was seven years of age. Her legs were not markedly deformed. The pelvic diameters were as follows: Intercristal, 10¼ inches; interspinous, 9¾ inches; diagonal conjugate, 4 inches. The true conjugate would thus be about 3¼ inches. Her first child had been delivered by means of forceps. In this, her second confinement, the head had presented well flexed with the occiput towards the front and left. The head was partly moulded into, but had not passed the brim. I gave chloroform, and Dr. Harrington, one of my residents, applied Milne-Murray's axis-traction forceps. He had to use considerable traction force, and, as the head passed the promontoty, we were both aware of a thud. The child soon cried, and seemed to suffer no inconvenience from the very marked depression of the left frontal bone (see Fig. 78). I applied very firm pressure to the head, but failed to raise the depression. As the patient lived in a single room, and the surroundings were anything but sanitary, I decided to leave the child until the mother could accompany it to the hospital.

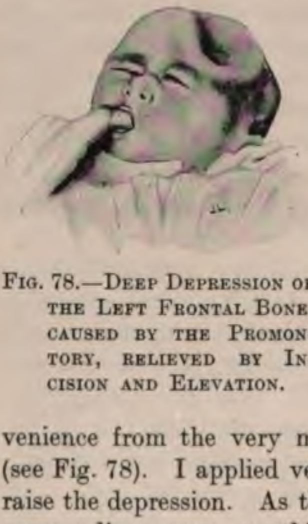

FIG. 78.—DEEP DEPRESSION OF THE LEFT FRONTAL BONE, CAUSED BY THE PROMONTORY, RELIEVED BY INCISION AND ELEVATION.

The mother made a normal recovery, and she and the child were admitted to the Maternity Hospital on August 23. The child was quite well, but the depression in the bone had not risen at all. On August 24, after Dr. Lindsay had taken photographs and made a cast of half of the head, I reflected about 1 inch of the scalp from the back portion of the frontal bone, and made a small incision through the bone, about ¼ inch in front of the suture, then passed McEwen's periosteum elevator between the dura mater and the bone, and raised the depression. The incision was made away from the suture, because the dura mater is always adherent at the suture, and I wished to avoid cutting the dura. The bone was fairly hard, but I cut through it with a sharp-pointed bistoury. When I passed the elevator in there was a gush of blood-stained serum. I was surprised at the amount of force required to raise the depressed bone. The wound in the scalp was closed with stitches.

The child stood the operation well, but took nearly as much chloroform as an adult. The scalp wound healed by first intention, and the child kept perfectly well.

It is surprising that so marked a depression caused no inconvenience, but if it had been left the brain functions would sooner or later have become affected, and the child have developed into an idiot or an epileptic.

Case IV.—The most marked depression I have ever seen was in a case where there was no deformity of the pelvis. The abdomen was exceedingly pendulous. Delivery was effected with high forceps, and the head showed the remarkable appearance depicted in Fig. 79. The child seemed perfectly well. The depression had lessened considerably by the time of dismissal. As to the final result, I cannot say anything, as I never saw the child again.

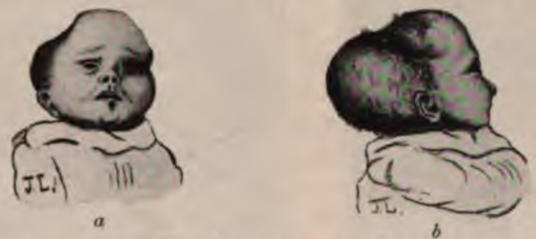

Fig. 79.—Depression of Skull.

a, Front view; *b*, side view.

Case V.—This child was delivered by forceps through a contracted brim by Dr. White, outdoor house-surgeon. He brought the child into hospital, and under my supervision operated upon it when it was three days old. Fig. 80 shows the condition before operation, and Fig. 81 after complete recovery.

I have also operated on a case where there was a depression of both frontal bones. The patient made a good recovery. In none of these cases operated on has there been the least trouble afterwards.

Fracture of the Long Bones.—One or both femora may be broken in doing version, or in delivering an impacted breech by traction in the groin. If a blunt hook is used for the latter purpose, a fracture is likely to occur. The fracture may be through the shaft, or a separation of the epiphysis.

Treatment.—It is difficult to put a long splint on, as the natural position of the child is to lie with its legs drawn up during the first few days of life. If a long splint cannot be applied, you may apply extension to both legs by means of small weights over pulleys, so arranged above the child that, as it lies on its back in its crib, both legs are drawn up at right angles to its body. Union takes place very quickly.

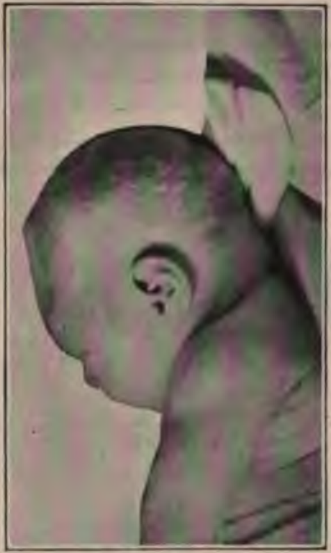

FIG. 80.—DEPRESSION OF SKULL RAISED BY OPERATION.

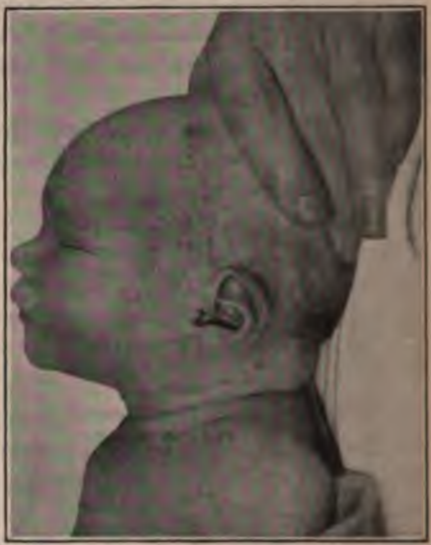

FIG. 81.—SAME CASE AFTER RECOVERY FROM OPERATION.

Fracture of the Clavicle may be caused when you are relieving an arm, or making traction to deliver an after-coming head.

Treatment.—Put the arm up in the usual way, fastening it securely to the chest with strips of plaster.

Fracture of the Humerus.—This is usually caused in relieving the arm from above the head. When the arm is displaced to the back of the head, one may require to do it deliberately to save the child.

Treatment.—You may put small splints on, but the arm should also be firmly bound to the side of the chest.

Injuries to the Soft Parts.—The scalp may be injured. I have known it to be wounded in an attempt to rupture the membranes where they were already ruptured. If a cut is made into the scalp, it may extend, and a considerable portion be peeled off, as the head is coming through the pelvis. In careful hands such an accident should not happen. The skin should be replaced and stitched at once.

In face cases the eyes may be injured by rough examination. In delivering with high forceps, one blade usually presses over or near the eye. In the vast majority of cases no injury results, but occasionally, especially with badly-made instruments, the eye may be destroyed. I have known complete enucleation happen. In a flat pelvis, however, the eye may be injured, not by the blade of the forceps, but by the pressure of the promontory causing a fracture of the frontal, extending into the orbital plate. In many cases, subconjunctival hæmorrhages will be seen, even after normal deliveries. In some difficult deliveries you find hæmorrhage into the back of the orbit, or into the eyelid, and occasionally into the anterior chamber of the eye. The hæmorrhages are usually absorbed in a very short time.

I have already referred to the occurrence of corneal opacities during difficult deliveries. In the twenty-second volume of the *Transactions of the Ophthalmological Society* the first series of cases observed will be found recorded by Dr. W. Ernest Thomson, Ophthalmic Surgeon to the Glasgow Maternity Hospital, who has been investigating the condition. In addition to the cases reported, I have seen at least ten others. There was usually a distinct band of opacity in the vertical axis of the eyes, in addition to the less marked general opacity, but in some cases there were several bands in a barrel-stave arrangement, and in one case horizontal bands (Figs. 82 and 83). In most of the cases the opacity cleared up, but there was usually a linear scar left in the vertical axis. In one of the first cases a very dense opacity of the whole cornea remained so long as the child was under observation, and it seemed as if it would be permanent. The cause of the opacity was evidently the pressure to which the eye was subjected during delivery, but how the pressure acted was not very clear. The following case, which occurred quite recently, has thrown some light upon the subject, and has furnished us with the probable explanation:

A. M., 1-para, aged nineteen, full time; delivered by axis-traction forceps in the Walcher position. The patient's pelvis was a typically flat one, with the following measurements: Interspinous diameter, 9¼ inches; intercristal, 9½ inches; diagonal conjugate, 4 inches; true conjugate (by direct measurement), 3½ inches. Delivery was effected in the Walcher position. The child, a female, weighed 7¼ pounds, Its heart beat for a considerable time after birth, but it could not be resuscitated. A very marked opacity was noticed in the right eye. Both eyes were removed, and Drs. W. Ernest Thomson and Leslie Buchanan examined them microscopically. They found that the posterior elastic lamina of the cornea was ruptured in several places, and that there was a certain amount of laceration of the posterior layers of the corneal tissue proper. A full report of the condition has been published by Drs. Thomson and Buchanan in the twenty-third volume of the *Transactions of the Ophthalmological Society*. The opacity seemed to be due to the aqueous, acting upon the corneal, tissue, and the permanent bands to the formation of scar tissue at the seat of the rupture of the elastic lamina and corneal layers. The fractures in the posterior elastic lamina are usually vertical in direction, and hence the frequency of vertical bands of dense opacity.

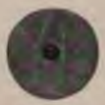

FIG. 82.—OPACITY OF THE CORNEA SHOWING TWO VERTICAL BANDS. PATIENT AGED EIGHT WEEKS (DRAWN BY DR. BALLANTYNE).

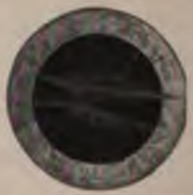

FIG. 83.—OPACITY OF THE CORNEA SHOWING TWO TRANSVERSE BANDS. PATIENT, AGED FOUR MONTHS (DRAWN BY DR. BALLANTYNE).

Pressure upon Nerves.—The facial nerve is very frequently pressed upon by the blade of the forceps, at its point of exit from the skull, and as a result one-sided facial paralysis is very common. As a rule, improvement begins within a few hours, and in a day or so the child's face will be quite straight. I have occasionally seen the paralysis persist for a week or two. In such cases there had probably been some hæmorrhage into the nerve sheath or round it in the foramen.

Pressure upon the brachial plexus sometimes occurs in injury or dislocation of the head of the humerus. The plexus itself may be injured, without any apparent injury to the joint. The paralysis gradually passes off, but a certain amount of permanent damage may remain.

Hæmorrhage into the Brain or its Membranes.—In fracture of the skull this is apt to occur, but you may have hæmorrhages without fracture, especially in difficult head-last labours. These, if they are at all serious, may cause the death of the child during delivery, or very shortly afterwards. They may cause convulsions, and if the child survives these, it may grow up more or less of an imbecile.

Case of Cerebral Hæmorrhage without Fracture of the Skull: Large Full-time Child; Forceps Delivery; Child Dead Born.—Post-mortem examination by Dr. Carstairs Douglas:

"The head exhibited no evidence of fracture or depression of bones, but the latter were extremely mobile. A large caput lay over the posterior part of the head, chiefly to the right. On reflecting the scalp several large hæmorrhages were found, chiefly above the pericranium, and lying over the bones below the caput. Under the pericranium posteriorly a smaller amount of dark blood was seen. On reflecting the parietals the pia was seen to be distinctly engorged. Small hæmorrhages were found over the right frontal lobe and lying upon the plate of the ethmoid. There were small effusions in the left middle fossa of the skull, and also on the tentorium, chiefly to the left side. Larger hæmorrhages were found in both posterior fossæ."

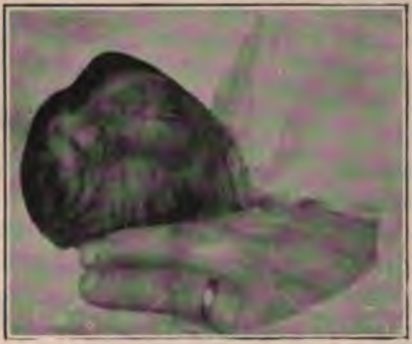

FIG. 84.—CEPHALHÆMATOMA.

Cephalhæmatoma.—This is a swelling on the part of the head which presented, and is caused by hæmorrhage beneath the periosteum. It may be apparent at birth, but it usually forms shortly afterwards. There is usually only one swelling, but there may be two. It may be on either parietal bone or on both, or in some cases on the occipital bone. It may be nearly as large as a closed fist, and it feels fairly soft. Palpation will reveal that it is confined to one bone, and does not extend beyond the edges of that bone. It never extends beyond the sutures, because the periosteum is firmly adherent at the edges of the bone. If there are two tumours they will be on separate bones, and quite distinct from each other. It is easily distinguished from a caput succedaneum, as the latter is in the scalp, not beneath it, and is not bounded by the sutures.

The effused blood will gradually be absorbed, but it will be six or eight weeks before the swelling has disappeared. If there has been an injury to the scalp during delivery the clot may suppurate.

Treatment.—Elastic pressure may hasten absorption, but as a rule no treatment is required, unless suppuration occurs, when a free incision should be made.

The child from which the photograph of Fig. 84 was taken presented in the third position, R.O.P., and was delivered by forceps. Anterior rotation occurred during the delivery, and the forceps had to be reapplied.

Hæmorrhage may occur into other organs, such as the *liver*, especially in cases where artificial respiration by Schultze's method has been tried. The liver is, of course, a very heavy organ compared to the rest of the body, and a considerable strain must be put upon its suspensory ligament in the performance of this method of artificial respiration. In such cases, I have more than once found considerable hæmorrhage beneath the suspensory ligament of the liver.

Laceration of the groin may be caused in delivering an impacted breech, if a hook is used.

The genital organs of the child may be injured, in rough examinations, in a breech case. The anus has more than once been mistaken for the os uteri, and attempts made to dilate it. In a female child the perineum has been completely torn and a cloaca formed in this way. Such an accident should, of course, never happen.

CHAPTER XLIII

ABNORMALITIES AND DISEASES OF THE NEW-BORN CHILD

Intra-uterine Amputations from Amniotic Bands—Defective Development of Bones—Want of Development of Limbs—Club Feet—Imperforate Anus—Hypospadias: Case—Difficulty of Micturition—Shortness of the Frænum Linguæ—Jaundice—Thrush—Discharge of Blood from the Vagina—Engorgement of the Breasts — Ophthalmia Neonatorum — Erythema and Intertrigo — Syphilitic Eruptions — Pemphigus Neonatorum: Cases — Hæmorrhage from the Cord—Tetanus Neonatorum—Septic Infection—Non-closure of the Foramen Ovale—Spina-bifida—Sudden Death of the Child—Convulsions.

Intra-uterine Amputations.—I have seen several instances of this interesting condition. The following case was very carefully examined by Dr. John Lindsay, to whom I am indebted for the report and excellent drawings. The fœtus was expelled at the sixth month in the complete sac. I found the specimen in the museum, but there was no record of it. Before destroying it I fortunately opened the membranes, and needless to say, all thoughts of destroying it were at once given up. There was still some liquor amnii in the sac, but not very much.

From Dr. Lindsay's report it is quite evident the amputations and deformities were caused by amniotic bands.

"*Fig.* 85.—The right upper limb and hand are normal, with the exception of the four digits. These are represented by four very short conical processes, each with the impression of a nail at the free extremity. A lateral process from the ring finger overlaps the base of the middle finger on the dorsal aspect. A strand of membranous tissue, a very small fragment, lay along the web of the fingers in the palmar flexure, and was attached to the root of the middle one. This could not be merely a flake of desquamated epithelium; it was too tough and too firmly attached for that. Besides, there is no evidence of peeling elsewhere. It did not appear to encircle or constrict any of the digits, but if it had another point of attachment, as probably it had, the dragging on the growing limb-bud would doubtless produce the distortion.

"*Fig.* 86.—As in the case of the right side, only the digital portion of the left upper limb is deformed, the thumb being normal here also. Where the fingers should have been there is an irregular group of four small tubercles and a large pedunculated swelling. None of the digits can be identified either by form or position. The neck of the

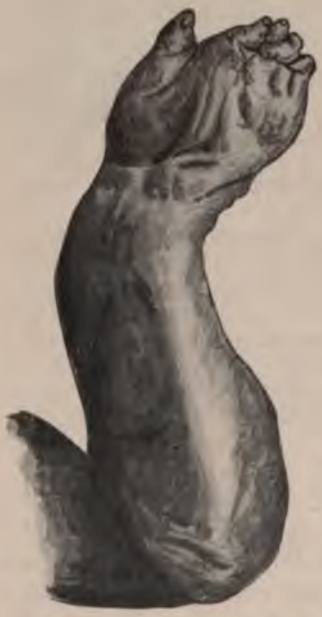

FIG. 85.—RIGHT FOREARM AND HAND.

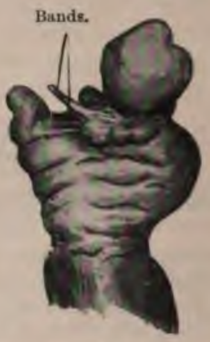

FIG. 86.—LEFT HAND.

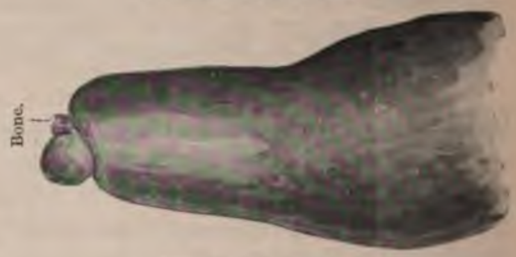

FIG. 87.—LEFT LEG.

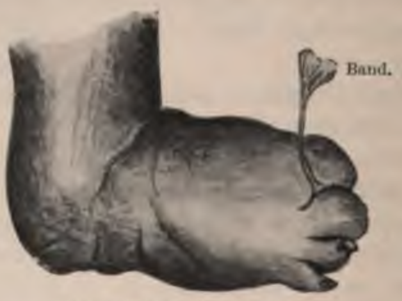

FIG. 88.—RIGHT FOOT.

pedunculated body is encircled by a constricting band having a short free end. Two very fine but strong bands run from the midst of the small tubercles to be attached to the side of the thumb.

"*Fig.* 87.—The left lower limb terminates abruptly at the junction of the middle and lower thirds of the leg. Here about $\frac{1}{8}$ inch of bone —only one bone—protrudes from the rounded stump, and internal to this there is a pedunculated fleshy nodule as large as a pea. No band was found here.

"*Fig.* 88.—The right lower limb is normal to the toes. The little toe is perfect, with a distinct nail. The toe adjacent to it ends in a small rounded nodule, and shows a mark which appears to be a rudimentary nail. Two quadrilateral masses represent the remaining three toes. Springing from the cleft between these two masses, and firmly attached there, is a slender band which widens out at its free extremity. It is about 1 inch in length."

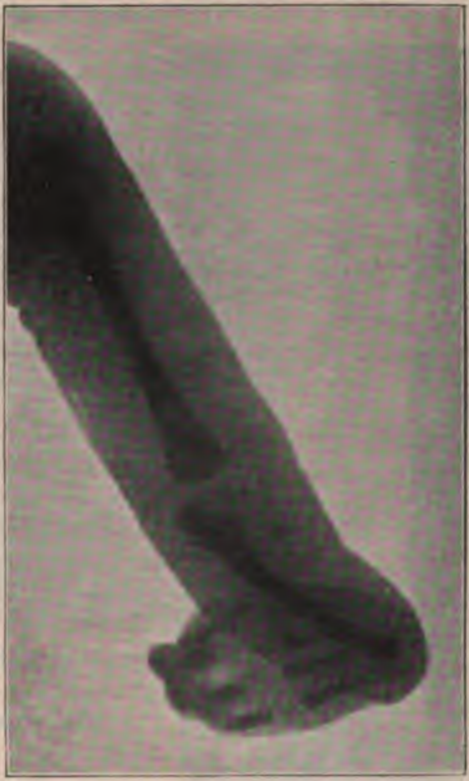

FIG. 89.—SKIAGRAM OF ARM.

Want of Development of Bones.—The case from which this skiagram (Fig. 89) was taken was that of a female child a month old. The hand was set at an acute angle to the forearm, and the thumb was absent. The skiagram shows that the radius is absent, as well as the bones of the thumb. The child had also a deformity of the left ear, the pinna of which was smaller than that of the right, and was bent down over the external meatus. There was also a small meningocele in the occipital region. The child, a first one, was small but healthy, barring its deformities.

I have seen another case in which the hand was set nearly at right angles to the forearm. In that case the fœtus was macerated, and had been retained *in utero* a month beyond the expected time of confinement.

In such cases, if one had to do podalic version, and happened to catch the deformed hand, it would be almost impossible to tell it from a foot.

Defective Development of the Limbs.—The following most interesting case first came under my notice when it was shown at the Obstetrical Society by Dr. Gemmill Thomson. When the child was nearly six months old it died in convulsions, and Dr. Thomson kindly sent me the body.

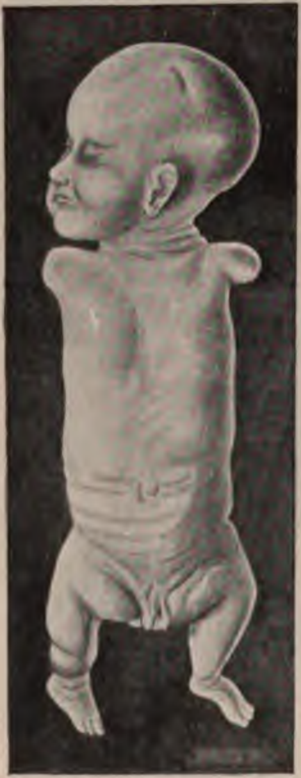

FIG. 90.—EXTERNAL APPEARANCE. DRAWN FROM A CAST (LINDSAY).

My friend Dr. John Lindsay undertook the dissection, and the following is his admirable report, for which I am deeply indebted:

"The subject of this report was shown alive at the meeting of the Glasgow Obstetrical Society of February 23, 1898. The case occurred in the practice of Dr. Gemmill Thomson, of Ayr, and when the child died in June of last year he sent the body to Dr. Jardine, who had it photographed, and handed to me for dissection. I now show the photograph and a cast, with drawings of the dissections, and the skeletons of the upper and lower limbs.

"Dr. Gemmill Thomson supplies the following particulars of the pregnancy and labour: The subject, a male, was the third child of the mother, the two preceding children being well developed and healthy. He was born on December 31, 1897, and died of convulsions on June 19, 1898. The mother states that she felt no fœtal movements during the pregnancy. The labour, which was believed to have occurred at eight and a half months, although the infant looked to be of full time, was easy and natural, the placenta being expelled with the child.

External Appearance (Fig. 90).—The body, from the pelvis upwards, was like that of a strong and healthy infant, of six or seven months, which had been subjected to amputation of both arms at the shoulder-joint. The stump on the left side was slightly more prominent than that of the right, owing, as it afterwards appeared, to the greater length of the rudimentary humerus on this side. On the extremity of each there was a shallow linear dimple. The lower limbs were very short, the shortening occurring almost entirely in the region of the thigh, this being represented merely by a fleshy fold between the knee and the inguinal line. The feet had each only three toes, but otherwise were well formed, and in proper relation to the leg at the ankle.

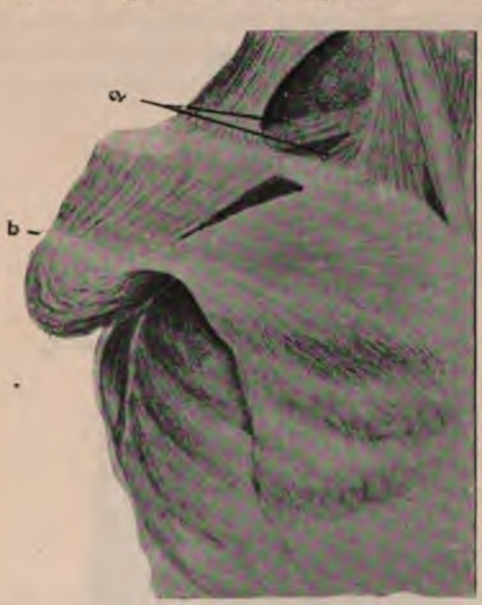

FIG. 91.—RIGHT SHOULDER: FRONT, SUPERFICIAL (LINDSAY).

a, Double omohyoid ; *b*, line of union of deltoid, pectoralis major and latissimus dorsi.

"*Internal Organs.*—The brain was carefully dissected throughout, the pituitary and pineal bodies specially noted, but neither in the surface markings nor in the deeper parts could any deviation from the normal be detected. The spinal cord was not examined. All the other organs were healthy and well formed, but there was intussusception of the ileum at two places, the intussusception being easily reduced, and without sign of inflammation.

"*Skeleton.*—The cranium and trunk were normal. So also were the clavicles and scapulæ, except that on the right side the relations of the articular surfaces of the scapula and humerus were reversed, the glenoid facet being convex, the head of the humerus concave. The humerus on this side was hardly over an inch in length, and was recurved as shown in Fig. 94. The left humerus was 1¾ inches long, nearly straight, and tapering to a blunt point; the joint normal.

"The pelvis was well formed in all respects save that the acetabulum was entirely absent on both sides. To the point on the os innominatum, where the articular cavity should have been, there was attached a thick, twisted strand of fibrous tissue about 1½ inches long, ending in a cartilaginous nodule that was obviously the lower epiphysis of the femur (Fig. 96). On the outer side, and near the upper end of the same band, there was another and smaller nodule of cartilage, the great trochanter. The femur thus consisted of the trochanter and lower epiphysis, the fibrous band representing the head and shaft. The tibia was strongly curved forwards, but not

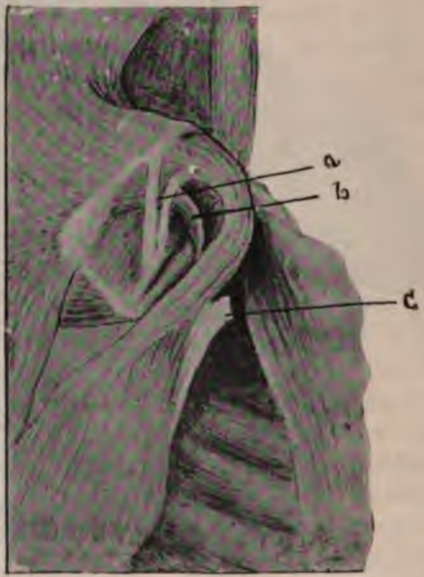

FIG. 92.—RIGHT SHOULDER: BACK, SUPERFICIAL (LINDSAY).

a, Slips from infraspinatus to deltoid; *b*, slip from deltoid to teres minor; *c*, some fibres from the latissimus disappearing in the subcutaneous fat.

otherwise malformed. The fibula was altogether absent, but, nevertheless, the interosseous membrane was well developed, and had a thickened cord-like edge where the fibula should have been. The tarsus consisted of (*a*) a large cartilaginous piece, incompletely divided into two, so that it was probably formed by the coalescence of the astragalus and os calcis ; (*b*) two small cube-shaped cartilages in line with the first metatarsal bone, which was excavated on the inner side to receive one of them. If the position of these may be taken as a guide, they were the navicular and internal cuneiform. The other tarsal elements were awanting. The three metatarsals present, and the phalanges in series with them, were not in any way abnormal.

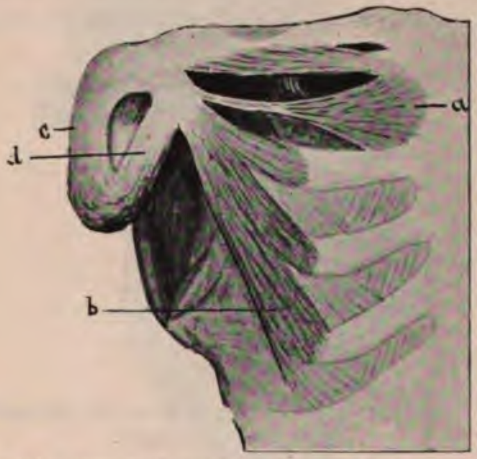

FIG. 93.—RIGHT SHOULDER: FRONT, DEEP (LINDSAY).

a, Supernumerary pectoralis minor ; *b*, pectoralis minor ; *c*, long head of the biceps ; *d*, short head of the biceps and the coraco-brachialis.

"*Muscular System.*—The most notable point here was the occurrence of many anomalies quite unconnected with the defective parts. Thus, the omohyoid on the right side was double (Fig. 91). On the left the sterno-mastoid and cleido-mastoid were separate and distinct from origin to insertion, there was a supernumerary pectoralis minor on the right (Fig. 93), and the psoas parvus, though present on the one side, was entirely absent on the other. These, and others to be afterwards mentioned, are variations which are found in subjects otherwise conforming to the type. It is the number of them occurring in this one body that is of interest and importance.

"The following description of the anatomy of the limbs applies to both sides. Where there was difference between them, the difference is specially referred to :

" *Upper Limbs.*—The subcutaneous fat over the extremity of the stumps was increased in depth, and contained much fibrous connective tissue. The lymphatic glands were of the usual size, and were supplied, as is also usual, by the alar thoracic branch of the axillary artery. The trapezius, rhomboids, and all the other muscles between the trunk and shoulder-girdle, were normal. The great superficial muscles of the arm, the latissimus dorsi, deltoid, and pectoralis major, were also normal from their origin to very near their insertion ; but before quite reaching that point the fibres of each became inextricably mingled in a common sheet covering the end of the stump (Fig. 91). This common mass was bound to the humerus by strands of fibrous tissue, one of which joined the tendon of the teres major, and so must be regarded as the tendon of the latissimus dorsi, whilst two others could be similarly indentified as the tendons of the deltoid and pectoralis major. On the left side, where the bone had been cut short at a somewhat lower point, there was less mingling of the muscles, and their insertions were consequently more distinct. The scapulo-humeral muscles were quite normal on the left side, but on the right they presented these curious modifications. From the surface of the infraspinatus two thin, but quite distinct, fleshy fasciculi passed to the postero-external surface of the deltoid, the upper one reaching as far as the acromion (Fig. 92), and the posterior fibres of the deltoid itself separated from the rest of the muscle, and, curving backwards, joined the teres minor, being attached also to the axillary border of the scapula by aponeurosis. The small pectorals on both sides were

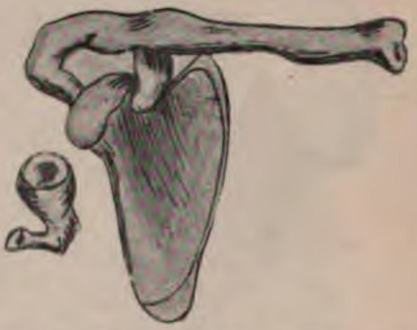

FIG. 94.—SKELETON OF SHOULDER GIRDLE AND HUMERUS ON THE RIGHT SIDE (LINDSAY).

normal. On the right side there was, in addition, the supernumerary shown in Fig. 93.

The deep muscles of the arm were represented by two bundles of fleshy fibres, largely mixed with connective tissue (Fig. 93). One of these, easily divisible into an anterior and a posterior fasciculus, was attached to the coracoid process, and doubtless stood for the coraco-brachialis and short head of the biceps. The other, attached at its upper end to the acromion, the capsular ligament, and upper border of the glenoid facet, was apparently the long head of the biceps. Both bundles passed into the common mass of fleshy and fibrous tissue, covering the end of the humerus. On the left side there was also a slight trace of the triceps.

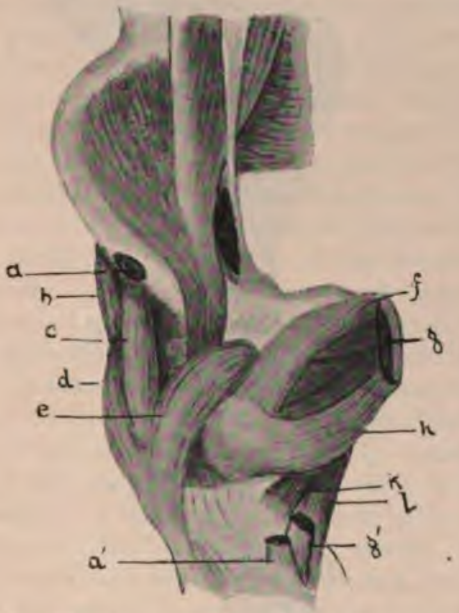

FIG. 95.—RIGHT THIGH: FRONT (LINDSAY).

a, *a′*, Cut ends of sartorius; *b*, tensor vaginæ femoris; *c*, rectus femoris; *d*, vastus externus; *e*, vastus internus; *f*, pectineus; *g*, *g′*, cut ends of gracilis; *h*, adductor magnus; *k*, semimembranosus; *l*, semitendinosus.

"*The Axillary Artery.*—On the left side the artery, after giving off the superior thoracic and the acromio-thoracic, divided into two trunks, an inner and an outer, the latter being the smaller of the two. The inner trunk gave off the long thoracic, and terminated as the subscapular. The outer trunk ran down the inside of the arm, and midway between the final bifurcation of the axillary and the upper border of the teres major it divided into two main branches,

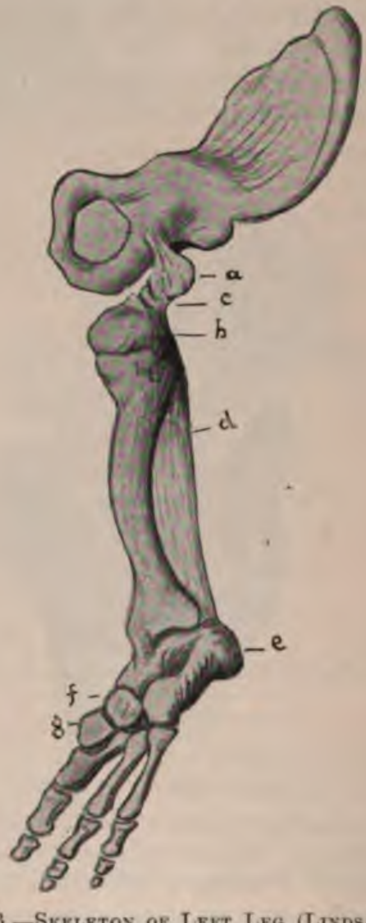

FIG. 96.—SKELETON OF LEFT LEG (LINDSAY).

a, Great trochanter; *b*, lower epiphysis of the femur; *c*, fibrous cord; *d*, thickened border of interosseous membrane; *e*, combined astragalus and os calcis; *f*, navicular (?); *g*, internal cuneiform (?).

one of which followed the course of the posterior circumflex, and the other, probably the brachial, ran to the extremity of the stump. The axillary of the right side was similarly disposed, but the two terminal branches, the posterior circumflex and the subscapular, were about equal in size, and nothing corresponding to the brachial could be found.

"The *brachial plexus*, as far outwards as the second three cords, was formed according to the plan given in Quain as that of most frequent occurrence. The outer cord ended as the musculo-cutaneous in the muscular bundle attached to the coracoid process. The middle cord, after giving off the subscapular and circumflex nerves, ended in the extremity of the stump by splitting into small twigs. These terminal branches would therefore represent the musculo-spiral nerve. The inner cord split into three, one of these ending superficially on the stump. The destination of the two upper branches, which were very small and delicate, could not be determined. The three together would represent either the internal anterior thoracic with the lesser and greater internal cutaneous nerves, or one of these was absent or lost, and the nerve ended as the ulnar. In any case, the outer and inner cords did not divide and again unite to form a median nerve. That important nerve, the main supply of the forearm and hand, was entirely absent; and no doubt there was a causal connection between its absence and the absence of the distal part of the limb, but which was antecedent and which consequent must remain in question.

"*Lower Limb.*—All the muscles of the thigh were much degenerated, and it was difficult to dissect them out of the mass of fat and connective tissue. They were modified in form chiefly in the direction of great shortening; but the os innominatum being well developed, except for the absence of the acetabulum, their pelvic origins were hardly at all affected. The tibia also being normal, the sartorius, gracilis, semitendinosus, and semimembranosus had their usual insertions, that of the last named, however, being thick and fleshy instead of tendinous. The biceps has ordinarily an attachment to the fascia of the leg. Here, in the absence of the fibula, that was its only insertion. The adductor muscles differed from the type, but still mainly in the direction of recognised variations. Thus the origin of the adductor longus extended from the body of the pubis along the ramus and tuber ischii, and the adductor magnus was in two parts. Both muscles with the pectineus and the adductor brevis were inserted into the inner side of the lower epiphysis. The quadriceps was a somewhat globular mass, easily separable into the usual component parts, the rectus arising from the ilium, the vastus externus from the trochanter, and the vastus internus from the lower epiphysis. The crureus was also distinguishable. The small common tendon was inserted into the head of the tibia without the intervention of a patella.

The tensor vaginæ united with the gluteus maximus, and this was inserted partly into the investing fascia and partly into the fibrous band uniting the upper to the lower cartilaginous nodule. The latter, the femoral attachment, was blended with the tendons of the ilio-psoas, quadratus, and obturator externus. The deeper glutei, the obturator internus, and the pyriformis, were attached to the upper cartilaginous nodule. It will thus be seen that this nodule represented the great trochanter, and the great trochanter only. The superior gemellus was absent, another common variation.

"*Leg and Foot.*—The extensor longus digitorum ended in three tendons, one of them going to the great toe after being joined by a slip from the special extensor of that digit. In the left leg the muscle was divided into two parts from its origin downwards, the tendon of the inner portion uniting with that of the extensor proprius hallucis. The extensor brevis also sent a slip to the great toe as well as one to each of the other two digits. Of the peronei muscles, only one of the three was present on each side; on the right it was the peroneus tertius, on the left the peroneus longus, which was present. The tibialis posticus, springing from the tibia only, was embedded in the fleshy portion of the common long flexor. The latter muscle sent a tendon to the great toe, but the short flexor did not, and the proper long flexor of that digit was entirely absent. The plantaris was of considerable size in the left leg, but was not found at all in the right. The transversus pedis was not found, but the small muscles of the great and little toes were well developed. There were two lumbricales, normally disposed, two dorsal interossei attached one to each side of the middle toe, and one plantar interosseus attached to the inner side of the little toe. The arrangement of these muscles would indicate that the middle toe was the true second digit, and that the absentees were the third and the fourth.

"In addition to the regular muscles of the part, which, so far as they have not been specially mentioned, were normal, there was also present in the left leg a small anomalous muscle, probably the tibio-fascialis anticus, springing from the lower front of the tibia and interosseus membrane, and ending in a thread-like tendon on the outer front of the astragalus. There was also a strand of muscular and fibrous tissue running from the angle of union between the heads of the gastrocnemius to be attached to the tuber ischii. What the significance of this may be I cannot guess, but I have found a similar structure in a calf with duplicity of one hind-leg.*

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* *The Veterinarian*, September, 1898.

"Of the blood-supply of the lower limb there is only this to be said: that the main stream of the femoral artery went by way of the profunda femoris to the back of the thigh. The sciatic artery was quite as large as the profunda, and the two united to form the popliteal.

"There was nothing unusual about the lumbo-sacral plexus or about the nerves of the limb, except that the great sciatic divided, while still within the pelvis, into the external and the internal popliteal nerves.

"*Etiology.*—Defective development of the limbs may be due either to a cause external to the fœtus, or to something within the organism arresting the action of the formative forces, or diverting them from their usual course. Pressure is the only conceivable external agency by which such a condition as we have here could be produced. This pressure might be brought about by means of amniotic bands, or through the resistance of fœtal membranes too closely applied to the growing embryo. The constriction of amniotic bands producing intra-uterine amputation would quite account for the absence of the arms. The dimples seen on the ends of the stumps might well be the cicatrices of amputation, nearly obliterated by the subsequent growth of the remaining parts. But there is nothing like amputation in the lower limbs. Still, the case which Dr. Jardine (Figs. 85 to 88, p. 538) showed last session proved that very slight inflammatory bands adhering to the growing limb-buds are capable of causing great distortion and even coalescence of parts. That case, however, in common with others referable to the same cause, showed what is not seen in the case of this child—namely, such irregularity in the deformities as might be expected from the action of chance adhesions.

"The effect of want of room in the amnion would be similar to that of pressure by bands; but to admit the probable truth of this theory it is necessary to agree to the reasonableness of the assumption on which it rests, that there is extreme deficiency of the amniotic fluid at the time when it is usually at its greatest amount relative to the size of the embryo. Such a condition has not been observed, and, *a priori*, its occurrence is exceedingly problematical.

"The defective development of the limbs, however, is not all that is to be accounted for here. There are the numerous muscular variations, the high division of the sciatic nerve, the unusual but not unprecedented course pursued by the blood-supply of the legs; above all, there is the strongly symmetrical character of the defects. It seems to me that these can only be satisfactorily explained by supposing some cause within the embryo itself. It would appear that this embryo was profoundly disposed to vary, and that the disposition to vary went beyond bounds. This is not much as an explanation; it leaves undiscovered the agent that started the development on wrong lines, but it is something in the search for causes to fix the limits within which they may be found."

Club Feet.—When a case of this occurs, the nurse should be instructed to straighten the feet and massage the faulty muscles several times daily. With perseverance and care even the worst cases can be improved very much. The feet are too small for the use of splints, excepting in talipes calcaneus. I have completely cured a case of that kind in a few weeks by massage and the use of small splints with foot-pieces.

Imperforate Anus.—If a child's bowels have not moved within a few hours of its birth, a careful examination of the rectum should be made. Mere inspection will not do, as the anus may be all right and yet the bowel be completely obstructed about half an inch up. Pass the little finger in, to feel if there is any obstruction. If there is no obstruction, a small dose of castor oil may be given, but oil should never be administered unless you have made sure there is no obstruction.

Treatment.—An imperforate anus should be operated on at once. An incision should be made in the position of the anus, and a careful dissection carried up, until the blind end of the rectum is reached. This should be opened into. There is always a great tendency for the opening to contract, and it will have to be dilated daily with a bougie. When the child gets older, if the tendency to contract continues, it will be advisable to have the constricted portion of the bowel excised, as in an ordinary excision of the rectum.

In some cases it is impossible to find the blind end of the bowel from below. The sigmoid should then be opened into through the abdomen, to give relief for the time being, and after the child has got a little stronger, a probe may be passed down to enable you to find the rectum from below.

Hypospadias.—In a case of this kind the genital organs of the male closely resemble those of the female, and if a careful examination is not made a mistake may easily arise, and a male may be actually registered as a female child. A case of this kind has recently come under my observation.

The child, a supposed female, when a fortnight old, was brought to me by the midwife who had attended at the birth, as it was tongue-tied. The midwife asked me to look at the genital organs, as they were larger than usual. I found that what the midwife and the mother had taken for somewhat enlarged female genital organs were really a divided scrotum with a testicle in each side. What they had taken for the vagina was merely a shallow depression. The penis resembled a somewhat broadened and enlarged clitoris. As the child had already been registered as a female, it was necessary to apply to the sheriff for a warrant to have the entry changed. In such cases it is rather awkward when the discovery of the true sex is not made until the age of puberty is reached. In this case it was fortunately made early. The midwife was a very competent woman, and had attended thousands of cases, both in connection with hospital and private work, and yet she was misled by the strong resemblance the organs had to those of a female.

In such cases it is of the utmost importance to definitely settle the question of sex, so a very careful examination should be made.

Difficulty of Micturition.—In boys, if the foreskin is long and adherent, it may close the meatus, and cause retention of urine, or great difficulty of micturition. The foreskin may require to be slit up, and in some cases a probe may have to be passed into the bladder. In some cases there may be very little urine excreted for the first day or two, and what little is passed may cause the child considerable pain. At birth the tubules of the kidneys often contain deposits of uric acid, and this causes the scanty excretion and pain in micturition. The child should be given hot water to drink, and 10-minim doses of sp. æth. nitrosi. A hot hip-bath from time to time will stimulate micturition and relieve the pain.

Shortness of the Frænum Linguæ.—This condition is occasionally seen, but is not so common as many nurses make out. If the tongue is tied to the tip, the child will not be able to suck properly. The frænum should be snipped and torn back with the fingernail. The bleeding is usually insignificant.

Jaundice.—A slight amount of jaundice is very common. It is due to the rapid destruction of the red blood-corpuscles which takes place in the first few days of life. It passes off in a short time, but one occasionally sees a case where the jaundice is very deep. It is usually seen in weakly children, especially premature ones. They very often die. In some the bile-ducts in the liver will be found occluded. Syphilitic disease of the liver may also be found.

I have seen one fatal case in an apparently healthy child. The post-mortem examination threw no light on the cause. (See case of Cæsarian section, Case VI., p. 520.)

Treatment.—Small doses of gray powder or calomel give the best results, but if there is occlusion of the ducts in the liver nothing will do any good.

Thrush.—The tongue and mouth of the child sometimes become coated with a white fur. This is most frequently seen in bottle-fed children whose bottles are not kept thoroughly clean. The cause is the growth of the fungus *Oidium albicans*. It is apt to derange the child's digestion and bring on diarrhœa. In common parlance, the thrush is said to pass through the child.

Treatment.—Apply glycerinum boracis to the mouth and tongue, and see that the bottles and teats are kept absolutely clean. A few doses of gray powder and bicarbonate of soda are very useful. Borax and honey is the common remedy, but the honey forms rather a good medium for the growth of the fungus.

Discharge of Blood from the Vagina.—This is not very common, but is seen every now and again. By some it is said to be purely a vaginal discharge, but it possibly may come from the uterus. In one case I examined it certainly came from within the hymen. It is of no consequence, and will cease in a day or two.

I have occasionally seen a discharge of blood from the bowel. If it is associated with the condition of hæmophilia, the child will probably die. I have seen one case of this disease where there was hæmorrhage from all the mucous membranes, and into the joints and different parts of the body. It soon proved fatal.

Engorgement of the Breasts.—This is very common, equally so in both sexes. A milky fluid can be expressed from the nipples. The breasts are hard and painful. If they are left alone the condition will soon subside, but, unfortunately, mothers and nurses will persist in squeezing the milk out, and then suppuration frequently occurs.

Treatment.—A pledget of wool should be placed over the breast, under the child's binder, to promote absorption. If suppuration occurs a free incision must be made, or the pus will burrow deeply.

Ophthalmia Neonatorum.—During the earlier part of fœtal life the eyelids are united by their margins, and this prevents anything entering the conjunctival sac, but by the time the fœtus is viable this union has disappeared. During labour the lids, as a rule, remain closed, but they may be easily separated, especially in face cases and those delivered by instruments. If they are opened during the passage of the head through the vagina, the vaginal secretions are sure to find entrance into the conjunctival sac. In the majority of cases, however, the lids are only separated after the head is born, and, as the eyelashes and margins of the lids are covered with the secretions, the infective material then gains entrance. If in man, as in some of the lower animals, the eyelids remain closed for some days after birth, the risk of ophthalmia occurring would be exceedingly small. As it is, by careful washing of the lids as soon as the head is born, the risk of infection can be minimized.

In about two-thirds of the cases of ophthalmia neonatorum the gonococcus is found in the discharge, and in the other cases, which are of a milder type, other bacilli have been demonstrated.

Time of Onset.—The symptoms usually begin to manifest themselves on the second or third day, but cases are occasionally seen where the disease is active at birth. I have seen one case where pus was present in the eyes when the child was born. One of my Cæsarian section babies developed it three hours after delivery. It must have been infected *in utero* (see Cæsarian section, Case V., p. 519). If the onset is delayed beyond the fifth day, the infection has not taken place during labour, but has been conveyed to the eyes through the medium of contaminated towels, sponges, etc. I have several times seen cases of this, where the infant's eyes were infected from the eyes of other children in the house, and in one very virulent case the infection came from the mother's eyes.

Course of the Disease.—A day or two after birth the eyelids become red and swollen, and at first there is a copious secretion of a serous nature, quickly turning to pus. The amount of pus formed is very great, and will stream out if the lids are not glued together. If the lids are glued together the pus will be retained, and on forcing the lids apart it will gush out. The palpebral conjunctiva becomes so swollen and injected that it protrudes as a bright red mass, when the lids are everted, and you will have difficulty in seeing the cornea. The conjunctiva bleeds easily. In most cases the cornea remains intact, but if the case is neglected, ulceration will be sure to commence, and if the utmost care is not taken, the eye will be very quickly destroyed.

Prognosis.—If a case is seen in time, and prompt treatment adopted, a cure will be quickly effected, but in neglected cases the sight of one or both eyes will probably be lost. Probably about one-third of the blindness in this country is caused by this disease. Blindness at birth is an exceedingly rare condition, and in the vast majority of cases the blindness is really caused during the first or second week of life. Besides total blindness of one or both eyes, vision may be more or less impaired by the presence of corneal opacities, but these, fortunately, clear up to a large extent.

Treatment.—There are few diseases in which prophylactic treatment has given better results. Prior to the introduction of what is known as Crédé's method the disease was a scourge among new-born infants in maternity institutions, but, like puerperal fever, it is now seldom seen.

In all cases of labour with a vaginal discharge, an antepartum douche of lysol should be given, but this is not sufficient, and, besides, gonorrhœal infection may be present in the vagina without any discharge; therefore the child's eyes in every case should be cleansed as soon as the head is born. If the lids are thoroughly wiped with swabs of wool or rag, wrung out of boiled water, or a solution of boracic acid or weak perchloride, that is all that need be done in ordinary private work, unless one is suspicious of gonorrhœa. In hospital work more energetic treatment has to be adopted. In what is known as Crédé's method, the eyes are cleansed as soon as the head is born, and when the child is washed, a few drops of a 2 per cent. solution of silver nitrate are instilled into the eyes. After that the eyes are carefully washed each time the child is bathed. Instead of silver nitrate, 1 in 2,000 perchloride of mercury solution is used by some. It should be borne in mind that silver nitrate and perchloride of mercury are not to be used together, or a double salt of silver and mercury will deposit in a dense white scum over the cornea.

The following method has been adopted by us in the Maternity Hospital: As soon as the head is born, the eyelids are carefully wiped with dry sterilized wool, so as to cleanse them before the child opens its eyes. As soon as the child is born the lids are separated, and a drop of a 20 per cent. solution of protargol is instilled into each eye. So far the result with the protargol or a 2 per cent. silver nitrate solution has been very satisfactory. The strong solution does not injure the eye.

When the lids become inflamed no time must be lost, as the sooner the disease is attacked the better. Have the eyes well washed with boracic solution, so as to remove all discharge. This is best done with a douche, but swabs of wool do quite well. If only one eye is affected, be careful not to allow any of the discharge to get into the sound one. When the eye is clean apply a 2 or 4 per cent. solution of silver nitrate, or a stronger one of 20 per cent. of protargol. See that the solution gets well into the eyes. The best way is to brush it in, so that you get into all the folds of the mucous membrane. The surplus solution can be washed out with a little salt water. Even when only one eye is affected put the solution into both. In bad cases this may be done twice a day, but once a day is usually sufficient. The eyes should be thoroughly washed every few hours, using boracic lotion. To prevent the lids adhering, a little vaseline may be put between them. The use of the silver solution should be continued until the pus secretion stops, but the eyes must be kept clean with a mild antiseptic, like boracic lotion, until every vestige of inflammation has subsided. If there is corneal ulceration a little fine calomel may be dusted in, but not along with a silver solution.

Among the poor the utmost carelessness is often manifested. As soon as the inflammation begins to subside they often stop all applications, and a relapse usually results. I have known a case, which was nearly well, allowed to relapse, and one eye destroyed and the other permanently damaged, although the mother was warned what would happen if she neglected to wash the eyes with the lotion supplied to her. One cannot too plainly point out to such people the terrible responsibility which rests upon them if they neglect such cases.

As the disease is exceedingly contagious, the utmost care must be taken to guard against others being infected.

Erythema and Intertrigo.—Many infants are very subject to irritation about the buttocks which may extend down the thighs. The buttocks and thighs become an angry red colour, and at places excoriations form. Every time the child micturates or defæcates, great smarting is caused. The condition usually arises from the want of proper care in changing the child's napkins when they are soiled, but it sometimes occurs even when the greatest care is exercised. It is very prone to occur in syphilitic children, and hand-fed children are more liable to it than breast-fed ones. The child suffers greatly, especially when its napkins are wet.

Treatment.—The greatest care must be taken to keep the child as dry as possible. Its bowels must be regulated. Fine dusting powders, like Huxley's, must be freely used. For bathing the parts, a thin gruel makes a good application. If there is a syphilitic taint, mercury should be given internally, and a small amount of calomel added to the dusting powder. Fuller's earth is largely used as a dusting powder, but it is rather coarse and may irritate.

Syphilitic Eruptions.—The commonest syphilitic eruption is a coppery-coloured, papular one, generally about the buttocks, but sometimes affecting other parts. Fissures are liable to form about the anus and mouth, and condylomata may also be seen. The child will probably be puny, and it will have snuffles. These indications manifest themselves within three weeks or so of birth.

Treatment.—Mercury should be given, either internally or by inunction. Calomel should be added to the dusting powder.

Pemphigus Neonatorum.—In most cases this disease is due to syphilis, but there is also a non-syphilitic form. It specially affects the soles of the feet and the palms of the hands, but it may be all over the body and face. It appears in the form of blebs which contain sero-pus. These blebs soon break and leave raw patches. The onset may be within a day or two of birth, but in one case I saw the blebs were present at the time of birth, and the child only lived a few hours. In the non-syphilitic form a few small blebs may be seen on different parts of the body, and they soon dry up after they have burst. In bad cases the ailment is very likely to prove fatal.

It is a contagious disease, and may easily be carried from one child to another. A number of cases have recently occurred in connection with one of our outdoor departments. The contagion was probably carried on the attendant's apron. The mother may be affected.

It sometimes assumes an epidemic form in hospitals. In such a case the strictest isolation of the mothers and children should be carried out.

The *Staphylococcus aureus* has been found in the serum of the blebs, and in fatal cases streptococci have been found in the blood. In one case we investigated staphylococci were present in the serum.

Treatment.—In the syphilitic form mercury should be given freely, and in the non-syphilitic arsenic.

Case I.—The child, at the time of birth, was above the average size for a first one, and appeared quite healthy. The mother was tubercular. On the third day blebs began to form on the legs, buttocks, arms, face, and neck. The hands and feet were affected on both palmar and dorsal aspects. The blebs quickly broke, and left large raw patches. In a day or two the child was in a deplorable state. The raw condition about the mouth prevented it taking its food, and the urine and fæces caused great irritation to the legs and buttocks. Snuffles were also present. Fortunately, death soon put an end to its sufferings.

I put it on 15-minim doses of liq. hydrarg. perchlor., and had the parts dusted with oxide of zinc and calomel.

The mother developed several blebs on the outside of the buttocks.

Case II.—The second child of this same patient, when born, appeared quite healthy, but about the third day small blebs about the size of split peas began to appear on the buttocks and legs. One appeared on the side of the head, and one or two on the arms. The feet and hands were not affected. The buttocks became copper-coloured, and there was a slight attack of snuffles. The child took its food (diluted cow's milk) well, and did not seem to suffer much in general health. The same treatment was adopted as in the first case, and the condition quickly subsided. In about a fortnight it was apparently all right.

The mother did not show any indications of syphilis, except the few blebs of pemphigus during the first puerperium, but she was in a weakly state of health. During the second puerperium she developed melancholia of a religious type, but recovered.

Hæmorrhage from the Cord.—This may occur, shortly after birth, from the ligature slipping or becoming slackened by shrinkage of the cord, or at any time during the first fortnight. In the latter case it is due to infection, syphilitic disease, or hæmophilia.

Treatment.—Before the cord is dressed it should be carefully examined to see that it has been securely ligatured, and if it is very thick, as is especially the case with premature children, or if the ligature is slack, a second ligature should be applied nearer the body. In all cases where a trained nurse is not in attendance I invariably apply a second ligature. When secondary hæmorrhage occurs from slipping or slackening of the ligature, a fresh ligature should, of course, be applied at once. One would imagine that common-sense would teach women to do this, but, as a rule, they send for the doctor when they discover there is bleeding, and do not touch the cord. If some time elapses before the doctor can reach the child, the chances are that he will find it blanched or actually dead. When the bleeding occurs later in the puerperium, it is a much more serious condition to treat. Various styptics, such as tannic acid, perchloride of iron, etc., have been tried. The suprarenal extract should be useful in these cases. Pressure may sometimes give good results, but the softness of the abdomen is a drawback. The best way is to transfix the umbilicus with two needles, and then put a firm ligature under them. If the case is one of hæmophilia, it will probably prove fatal, from hæmorrhage into other parts as well. In septic cases the parts should be sterilized as well as possible, and dressed with a wet antiseptic dressing.

Tetanus Neonatorum.—In tropical regions this disease is very common, but it is rare in this climate. In the Island of St. Kilda,* however, it was endemic for a long time, and for years nearly every child born on the island died from it within the first few days of life. Prior to the discovery of the tetanus bacillus, the cause of the disease in St. Kilda was ascribed to the diet of the mothers, which consists largely of sea-birds and fish. In 1895 my friend the late Dr. Geo. A. Turner, of Glasgow, who was for many years a medical missionary in Samoa, gave full instructions to the missionary on the island as to the proper way to deal with the stump of the cord, and since then there have been no more cases. Dr. Turner's instructions were that all the old baby-clothes on the island were to be burnt, and entirely new outfits got. When the child was born, the cord was to be carefully washed with perchloride of mercury solution, then dusted well with iodoform powder, and a dressing of sal alembroth gauze applied. In the event of fits coming on, the missionary was instructed to give the child 1 grain of chloral three times daily. Next year three children were born, and all survived. Since then the same gratifying results have been obtained. Not only have the instructions regarding the dressings been carried out, but as the people have greater faith in medicine taken internally than in anything applied externally, they have also given doses of chloral, and they will not give it up. They say they never had such good children before, as they never cry, and sleep most of the time for the first ten days of their lives.

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* St. Kilda is an island of the Outer Hebrides, which lies about seventy miles off the west coast of Scotland. For nearly nine months in the year it is entirely isolated, as it is impossible to land on it except in summer weather. There is no resident medical man, so the missionary has to do the best he can in times of illness. The houses have mud floors, in which the bacillus probably lurks.

Tetanus affects an infant in the same way as it does an adult, and will in a very short time prove fatal.

Treatment.—Preventative treatment is the only thing that is of avail. It is most effectual, but it must be applied from the birth of the child. It consists in dressing the cord antiseptically. When the disease has actually commenced, chloral is about the only drug, except the antitetanic serum, that is of any service. The serum should be given a trial in a dose suitable to the age of the infant.

Septic Infection.—It is surprising that this is not more frequent than it is. It is liable to take the form of pyæmia. There may not be very much local manifestation, but pus may form in different parts of the body, as in the joints. It may be mistaken for acute articular rheumatism.

In milder cases there is some redness and inflammation, extending for an inch or so round the umbilicus, but this may rapidly spread, and involve the whole of the abdominal and chest wall, and diffuse suppuration occur under the skin. Metastatic abscesses may form in different parts. The condition is of an erysipelatous nature.

Prognosis.—In bad cases it is exceedingly grave, but in mild cases the condition quickly subsides under appropriate treatment.

Treatment.—Antiseptic dressing of the cord will prevent it. When it occurs, if the cord has not separated, it should be removed, and the parts should be very thoroughly disinfected, and dressed with iodoform and a wet antiseptic dressing. Where there is diffuse suppuration the skin must be freely incised. In bad cases the child should be freely stimulated with brandy or whisky, 20 drops every few hours. Metastatic abscesses must be opened as soon as they are detected.

Non-closure of the Foramen Ovale.—At birth the communication between the right and left side of the heart should be closed by the Eustachian valve, but occasionally this does not occur, and then we have what is commonly known as a *blue baby*. The blood passes, to a large extent, from the right to the left side of the heart, instead of through the lungs, so that very little oxygenation of the blood occurs. The result is that the tissues are ill supplied with oxygen. If the oxygenation is not sufficient to support life, death ensues in a short time, but in some cases enough purification of the blood occurs to preserve life, and the child survives for a time, though adult life is rarely reached.

Diagnosis.—After birth, as soon as respiration is fully established, a child should become of a pinkish colour, showing that its blood is being aerated. If it remains of a dull, dusky bluish hue, and the hands and feet cold and bluish, the blood is not being purified. If the lungs have been expanded, the improper purification of the blood can only be due to patency of the foramen ovale or occlusion of the pulmonary artery.

Prognosis.—If the foramen does not close within a few hours, the condition is a hopeless one, and the prolongation of the child's life is not desirable, as, if it lives, it will be doomed to a life of suffering.

Treatment.—If nature fails to cure the condition, there is nothing you can do to help, except to keep the child lying perfectly quiet.

Spina-bifida.—This condition has already been mentioned in connection with obstructed labour. There is usually more or less of a sac, protruding through the gap in the spine, a spinal meningocele. The sac consists of skin and the spinal membranes, and its contents, of spinal fluid. It may burst during delivery, or it may be so bruised that the skin will very soon slough. In many cases the child will be still-born, or will die shortly after delivery, but, if it is likely to survive, treatment should be adopted.

Treatment.—Formerly, injection of the sac with Morton's fluid was the usual method, but of late years the much more scientific method of excision has given better results. If there is any liability to slough, the operation should be done at once, but, if possible, it should be postponed until the child is a few months old. When you excise the sac, close the gap in the spine, to prevent all the cerebro-spinal fluid draining out, and then carefully stitch the remains of the sac over the opening. The operation must be done with strict aseptic precautions.

CASE.—The sac was injured during delivery, and it was quite evident sloughing would soon occur. The sac was a small one, but its base was nearly as large as a penny. A few hours after birth it was dissected off, and the nerve filaments were returned into the neural canal. The erector spinæ muscles were united over the incomplete laminæ, and the skin edges brought together, tension on the skin being relieved by lateral incisions. Slight paralysis of the legs existed for a few days after operation, but a month later the muscles were quite strong. The operation was performed by my resident, Dr. S. J. M. Cameron, under my supervision.

Sudden Death of the Child.—Weakly children often die from atelectasis within a few hours or days of birth, but one occasionally meets with a case in which an apparently perfectly strong child dies suddenly within a few hours or days of birth. In my hospital cases I have insisted on having a post-mortem examination in all such cases, and in some we have found hæmorrhages into the brain, but in many there has been nothing on which we could base an opinion as to the cause of death. It has been suggested that a sudden enlargement of the thymus may account for the death in some cases. So far, we have not been able to come to any definite conclusion regarding this, but there is no doubt that in some of the cases the thymus has been very large.

Convulsions in the new-born infant are occasionally seen. I have already referred to this in connection with eclampsia. We have had several cases in which they have occurred in the infants, once or twice with fatal results. As I have already intimated, the child's urine will be found to contain albumin from the exciting cause, whatever it may be, acting on the kidneys in exactly the same way as it does on the mother's. They occasionally occur, however, after difficult labours, especially in deliveries by the breech, presumably from cortical hæmorrhages, as in the case on p. 252.

CHAPTER XLIV

INFANT FEEDING

Axioms—Weaning—A Wet Nurse—Essential Elements of Food—Requirements of a Proper Food for an Infant—How to Prepare the Food—Pasteurization—Boiling—Sterilization—Cream Mixture—Artificial Human Milk—Bottles.

At no period is more careful feeding required than during the first year of life. Statistics show conclusively that two-thirds of the deaths of infants under one year of age are due to diarrhœal diseases, caused by improper feeding, and also that the mortality among those brought up on the breast is comparatively very small. The importance of proper feeding cannot, then, be overestimated. A writer on this subject has said that "the children of the poor die from inferiority in methods of feeding sometimes, from inferiority in quality frequently, and from both combined frequently. The children of the richer classes are more frequently brought up alive, certainly, but crippled in health from imperfection in the method of feeding."

In his book on "The Feeding of Infants" Dr. Cautley says: "Certain statements are so often made, and are based on such a large amount of facts and clinical evidence, that they may be almost regarded as axioms, and may be expressed in this fashion:

"*Axiom* 1. 'Early mortality depends largely on diseases of the digestive organs.'

"*Axiom* 2. 'Every healthy mother contributes to the illness and death of her child by refusing to nurse it.'

"*Axiom* 3. 'Normal alimentation is especially important during the first few months of life, and for this period, at any rate, breast-feeding must be insisted on.'"

These axioms show how very important it is for every mother, who is able, to nurse her child. This is what nature intended, and nature is not likely to have made a mistake. There are, however, certain conditions under which nursing would neither be good for the child nor for the mother—*e.g.*, as when the mother is too weak, or is suffering from severe constitutional disease, especially if it is of a tubercular nature. A tubercular woman should never nurse.

When the child is born there is not usually much milk in the breasts, but there is always a small amount of *colostrum*, which acts as a natural purgative to the infant. By the second or third day active secretion will be established in the breasts, and there should be plenty for the wants of the little one. Regularity in feeding must be insisted on from the beginning. With most children every two hours during the day, with an interval of five or six hours at night, is quite often enough. If it is a weakly child, it may require it every hour and a half. In a very short time it will come to recognise its proper feeding time, but if it finds that by crying it will get food, it will soon form a bad habit. This crying is not always due to the child being hungry, but very often from indigestion, the pain of which is relieved for a little by the warm milk it gets from the mother, only to become worse afterwards. As the child gets older, the intervals between the feedings must be lengthened. It should not be allowed to take its drink too rapidly, and it should not fall asleep and lie with the nipple in its mouth.

A nursing mother must always bear in mind that she is bound to consider her child before everything else. She must, therefore, study herself as regards her diet, which must be simple and nourishing. All excitement must be avoided, or the milk will be so altered that it may have a very deleterious effect on the child. No claims of society must ever be allowed to weigh against the claims of the babe. The ideal mothers are those who lead quiet, uneventful lives, free from all excitement. I am afraid they are not as common in the present day as they were a generation or two ago.

Nursing should be continued for the first nine or ten months. In many cases the mother's milk will not be sufficient for the child's wants during the last month or two, so some artificial food will be required. Among the working-classes, in many cases, the children are nursed far too long. I have seen them as old as two years still on the breast. It is not good for the child, and it is certainly very bad for the mother. If the child is very delicate, it may be necessary to continue it at the breast for a month or two longer, but it should never be continued beyond the twelve months.

Weaning.—As regards *weaning*, a time should be selected when the child is in good health, and it should not be done in hot weather. In very hot weather the stomach and bowels are apt to be deranged by the artificial food, and fatal inflammation of the bowels may be set up. Weaning may be accomplished slowly, by lessening the number of drinks day by day, and increasing the artificial food, or it may be done suddenly. The gradual method is the better. A very good mixture to give is one of milk, cream, sugar and barley-water—2 ounces milk, 1 ounce cream, 1 lump of sugar, and 3 ounces barley-water. If this does not satisfy it, you can give it an ounce or two more; but we shall have something to say later on about the proper food for an infant of nearly a year old.

Breast-fed infants do not always thrive. There may be several causes for this on the part of the mother—from ill-health, the breasts and nipples may be affected, the milk-supply may be scanty, or in some cases the milk may actually disagree with the infant. The mode of life of the mother, and her mental disposition, may so affect the milk as to render it unfit for the child. Most of these defects may be remedied, provided the mother will devote herself to her child entirely, but if she will not do so, it will be better to wean it, in part, at all events.

If a mother is unable to nourish her child entirely, should she continue to do so in part? Most decidedly she should. It is a great mistake to imagine that the two forms of food will disagree. The artificial food may, but the mother's milk will not, in the vast majority of cases.

A Wet Nurse.—Now we come to consider a very important point. If the mother is unable to nurse, what is the best substitute? A wet nurse is undoubtedly the best, but it is one which only the wealthy can afford.

A wet nurse should be selected with great care. She should be a perfectly healthy woman, with well-formed breasts and nipples, and a plentiful supply of milk. Her own child should be near the same age as the one she is to suckle. Syphilis and tuberculosis in any form are the two diseases you must be specially on the look-out for. Syphilis is difficult to detect in some cases, but although the mother may show nothing, there will probably be some manifestations of its presence in her infant. Examine the infant very carefully for snuffles, cracks about the mouth or anus, and a coppery rash, especially over the buttocks. If any of these indications are found, or if the child is only puny and sickly, the mother should not be engaged. If her own child is not thriving, it is hardly likely that another woman's child will thrive on her milk.

The employment of wet nurses is becoming rarer and rarer. As they are a luxury that only the wealthy can afford, most children who cannot be nursed by their mothers must be brought up by hand.

In the adult, the body requires a constant supply of material for various purposes, the chief of these being for repair of tissues, which are constantly changing. We must have a constant supply to keep up secretions, as in digestion, and also fuel to be burnt up in the body, to supply heat and energy for every movement and action in life. In children, in addition, there is another great need, namely, for the structure and development of new parts, as the child is actively growing. The tissues have to be kept in repair, just as in a full-grown person, but, in addition, a child requires new building material, so to speak. It thus requires a more abundant supply of certain kinds of material than an adult.

The Essential Elements of Food are of Five Classes.

1. The Nitrogenous. The chief of these are the albuminates or proteids, found most largely in animal foods. The best examples are albumin of egg, the casein or curd of milk, the syntonin of muscle, and the gluten of wheat.
2. The Hydrocarbons or Fats.
3. The Carbohydrates, of which starch and sugar are the chief forms.
4. The Mineral Elements—salts of lime, potash, soda, and iron.
5. The most general and largely used of all—Water.

To ensure perfect health, an adult must be fed on materials drawn from each of these five groups. He may get on for a time without one or other, but, if deprived of any of them for any length of time, his health will suffer. For perfect health they must be combined. The same holds good for a child. With a child, as with an adult, the *albuminate* or *proteid elements* rank first. Nitrogen is essential for every vital process in the body. Protoplasm, which is the centre of life and energy in every individual cell, is formed of nitrogenous matters, and is nourished out of them. Nitrogenous elements are used in the building up of brain, nerve, muscles, and glands. It is quite clear, therefore, that these elements are of the utmost importance, especially for a growing child, not only to supply the waste of tissues, but also to build up new structures. If a child be deprived of nitrogenous food it will cease to grow, its muscles become flabby, and it will easily fall a prey to disease.

The second food element, *fat*, enters largely into many of the structures of the body, and is stored up in many parts of it; it serves as a fuel in the body, just as oil does in a lamp, or coal in a fire, and it keeps up the animal heat. It is wanted for every tissue, especially for brain and nerve-cells, and for marrow. If there is not enough of it in the food, the bony structures grow slowly, and are imperfectly developed. The deficiency of fat in the food is one of the chief causes of rickets. In a cold climate much more fat is required than in a warm one.

The *starch* and *sugar* elements are largely converted into fat. They are not so essential as the preceding. The Esquimaux, for instance, get very little of them, as they live almost entirely on animal food. They may get a little in summer from berries, but that supply is necessarily very limited. Their children, of course, get it during infancy from the lactose in the mother's milk. There is a considerable amount of lactose in milk, so it is a very necessary part of the food of an infant. There is no starch in milk, and this is an element which should not enter into the composition of a very young child's food. Starch cannot be absorbed as starch, as a solution of starch cannot pass through an animal membrane. It has first to be converted into sugar. This is done by ptyalin in the mouth, and amylopsin in the small intestines. For the first few months of its life a child does not possess this ferment, therefore to give it starchy food is to supply it with a stone instead of bread. When it begins to get its teeth the power gradually comes to it. A child should not have any starchy food until it has got at least six teeth, and even then only a small amount should be given. This is the reason why all the artificial foods are malted, as they consist largely of starchy substances which are changed by malting them. This important fact is constantly ignored, among the working-classes at least, as they are in the habit of giving cornflour, farola, etc., to their young infants. These things are easily prepared, and look bland and inviting, but they only serve the purpose of irritating the stomach and intestines, as they cannot be digested.

The *mineral* elements are essential at all times of life, but especially so to a growing child, as they enter largely into the formation of the bones.

The last element, *water*, is a most important one. It is necessary for the solutions and secretions, and for building up new tissues, which consist of four-fifths of water.

Numerous experiments have shown that, in order to keep an adult body in perfect health, the various elements should be supplied in the following proportions :

Proteids (albumin, casein, etc.)	5·00
Fats	3·00
Carbohydrates (sugar and starch)	15·00
Salts	1·15
Water	75·85
	100·00

For a child the proportions are not the same. Human milk may be taken as the proper standard food for an infant, and, on analyzing it, it is found to contain approximately :*

Proteids	3·500
Fats	3·000
Carbohydrates	4·000
Salts	0·138
Water	89·362
	100·000

If we study these tables, we see that the adult should get 5 parts proteid to 3 of fat, while the child should get 3½ proteid to 3 of fat—*i.e.*, the *proteid* and *fat* in a child's diet should be nearly equal, instead of 5 : 3, as in the adult's. Roughly speaking, a tiny infant requires from a half to three-fourths as much *fat* in twenty-four hours as a full-grown man. The *proteid* element also requires to be much higher in proportion to the carbohydrate—*i.e.*, they are nearly equal, instead of as 5 : 15. It is of the utmost importance to remember that the food of a child requires this large amount of fat. Milk is a rich emulsion of fat, but this is too often entirely forgotten, and children are constantly being fed on foods destitute of this important element.

So much for the elements; but there are certain other qualities necessary for healthy nutrition. If an adult is deprived of fresh vegetables, and is fed on salted meat for any length of time, he will be attacked with scurvy. This antiscorbutic element is contained in human milk, and a child on the breast will never get scurvy unless the mother has the disease. Fresh cow's milk contains it also, but condensed milk loses some of this property, and so does boiled milk to a slight extent. It is absent from all farinaceous foods.

The food must contain a large amount of animal matter. From a purely vegetable food sufficient proteid or fat cannot be obtained. A purely vegetable diet will cause a child to be anæmic, flabby, rickety, and scorbutic.

The food must also be in a condition in which it can be absorbed. The stomach of an infant is only designed to deal with the bland and easily digested mother's milk. It cannot deal with solid masses.

As regards the quantity of food a child requires, we may be guided, to a certain extent, by the amount of milk secreted by the mother. During the first few weeks of suckling, the breasts yield about one pint of milk. This gradually increases, until, by the end of nursing, they will be secreting 3 pints. To begin with, a child should get the equivalent of nearly a pint of its mother's milk, and this should be increased. For the first month it should be fed every two hours, getting 2 ounces at a time.

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* "Artificial Feeding and Food Disorders of Infants" (Cheadle). The amount of proteid given here is much greater than in most other analyses.

After the first month, 3 ounces every three hours should be given. If it is not satisfied with this, you will have to give more. To a certain extent the child's stomach will regulate the amount, by rejecting the surplus. To an infant vomiting is not a disturbing occurrence, as it is to an adult. The milk simply wells up without any discomfort. This is a merciful dispensation, otherwise there would be a vast deal of suffering among them, as the majority of hand-fed infants are allowed to take far too much at a time. The stomach of a new-born infant is a very small organ, and only holds about three-fourths of an ounce when undistended.

Requirements of a Proper Food for an Infant.

1. It must contain the different elements in the proper proportions, as they are contained in human milk.
2. It must contain the antiscorbutic property.
3. The proper quantity for twenty-four hours must represent the nutritive value of from 1 to 3 pints of human milk, according to the age of the child.
4. It must not be purely vegetable, but must contain a large quantity of animal matter.
5. It must be in a form suited to the digestion of the infant, and at a suitable temperature (100° F.).
6. It must be fresh and sound.

Cow's milk is what is usually substituted. It fulfils all the conditions as regards containing the different elements, it is an animal matter, and also has the antiscorbutic property. The pure milk contains a great proportion of the elements, especially of the proteids. There is, however, this drawback, and a very serious one it is—viz., that it forms a very much denser curd than human milk, so that the stomach of the infant is unable to deal with it in an undiluted form.

Goat's milk is sometimes used, but its curd is denser than that of cow's, so it is even less suitable.

Ass's milk forms a very light curd, and it is very suitable for delicate children. The elements in it are in less proportion than in human milk, except the sugar, which is greater. Ass's milk is difficult to obtain, and is therefore little used.

To obviate the difficulty regarding the density of the curd, cow's milk is given in a very dilute form—viz., one part milk and two parts water. This reduces all the elements very much, so that to get the proper amount the child would require to take nearly 3 pints of this mixture in twenty-four hours, which is far too much. As a matter of fact, many children do very well on from 1 pint to 1¼ pints of this for the first month, and then the water element can be decreased gradually. The carbohydrate or sugar element is always increased by adding sufficient sugar to make the mixture sweet. Milk-sugar is the proper form to use, but ordinary cane-sugar does very well. The other elements can also be increased. For the proteid elements raw meat-juice can be added, and for the fat we have an excellent substance at hand—viz., cream, which is almost pure fat. Sometimes cod-liver oil is used if cream cannot be obtained, but, if you can get milk, of course cream can also be got.

As I have already said, the massive curd of cow's milk is the one great drawback to it. Diluting with water does not overcome this satisfactorily, but there are other expedients. By some authorities boiled milk is said to give a less dense curd than unboiled. If barley-water be added instead of ordinary water, the curd is much lighter. Lime-water has the same effect. The addition of lime-water is very necessary for another reason, viz., to render the milk alkaline, to correspond with the mother's milk. Cow's milk very quickly becomes acid. Bicarbonate of soda is sometimes used for the same purpose, and it also makes the curd lighter, but it should not be used to any extent, as it may have a very injurious effect on the child's digestion.

By peptonizing the milk the curd is got rid of entirely, but this is a form which should only be used in an emergency, and not for any length of time, because if you predigest the food, the stomach will lose from disuse the power of doing its work properly.

Condensed milk, when properly diluted, gives a very fine curd. Many children are brought up on it, and some of them get very fat and thrive well, but as a rule it is not a good form of food. It is deficient in fat, and has far too much sugar in it, while the antiscorbutic property is wanting. Another drawback is that different tins of it vary very much in composition, and it is too often made from skim milk. It is useful on sea voyages. Condensed skim, or separated, milk should never be used. The fat is practically all removed from it, and it is therefore absolutely useless as a food for an infant.

The order in which these different mixtures may be ranked as regards the digestibility of the curd is :

1. Peptonized milk (only to be used in an emergency).
2. Cow's milk with barley-water.
3. Cow's milk with lime-water.
4. Condensed milk.
5. Cow's milk with bicarbonate of soda.

How to Prepare the Food.

First, a word about "one cow's milk," which many dairies advertise. Milk from one cow is excellent, if you are living in the country, and know about your cow. Some cows give much richer milk than others, and it will be all right if the cow happens to be a good one, but the chances are just as great that her milk may be poor. It is far better to take milk from the ordinary mixed milks, as, at all events, it will be sure to be an average milk. If the cow is kept in the city, you had better not have anything to do with the milk.

We speak about getting pure milk, but, from a bacteriological point of view, I am afraid there is no such thing as absolutely pure milk supplied. You are all familiar with the ordinary methods of milking, which is usually done in a more or less dirty byre. Milk is one of the finest media we have for micro-organisms to grow in, and it is frequently the source of disease. It will not keep sweet for any length of time. Changes begin in it as soon as it is exposed to the air. All milk contains numerous micro-organisms. There are no less than 700 different species of milk bacteria, 150 being dairy bacteria. Many of these produce a mature growth in twenty minutes, which, in turn, produces its family twenty minutes later. They quickly give rise to changes in the milk, as souring and curdling, and render it unfit for a child, as it will derange the stomach, and set up severe diarrhœa and vomiting. Deleterious changes may take place in it which cannot be detected by taste, smell, or sight. The milk may contain the germs of scarlet fever, typhoid, diphtheria, or tuberculosis. Some method must be adopted, then, to prevent, or at all events to minimise, the risks. There are three chief processes:

1. *Pasteurization.*—This process consists in raising the milk to a high temperature (70° C. or 158° F.), and keeping it at this temperature for at least half an hour, and then cooling it down rapidly. There are various different forms of apparatus for doing this. It can easily be done with an ordinary saucepan, the milk being placed in a clean bottle stopped with cotton-wool. The pan is filled with water as high up as the milk in the bottle. It is placed on the fire and heated

until the water reaches 155° F., at which temperature it is kept from twenty to thirty minutes, and then cooled rapidly.

2. *Boiling* the milk is a simple method. It should be placed in a clean saucepan, and brought to the boil. It should be kept in a cold place, preferably in a refrigerator, and carefully covered up. A very good plan is to place each meal, mixed in proper proportions, in a clean soda-water bottle and plug it with clean cotton-wool. Several of these can be prepared at once. They should then be placed in a wire stand, which will keep them off the bottom of the pan, which is filled up to the necks of the bottles. The whole is boiled for half an hour, and then taken off the fire and allowed to cool. The bottles should then be put in a refrigerator. If you put them into the refrigerator hot they will be likely to burst.

There are certain objections to boiling the milk. It alters the taste and smell (but if the child has never had anything but boiled milk it will not object). It coagulates to a slight extent, and thus a small proportion of the nourishment is lost. On the other hand, it forms, according to some authorities, a finer curd than unboiled milk, which is a distinct advantage.

3. *Sterilization* by steam is the third method. The milk, contained in suitable bottles, is subjected to the influence of superheated steam for twenty or thirty minutes. There are numerous sterilizers on the market. Some of them are devised so as to sterilize each meal separately in a bottle of its own, doing a sufficient number for the day at once. The food is heated when wanted, and given directly from the bottle.

Pasteurized or sterilized milk is now sent out by some of the dairies, in hermetically sealed bottles. For safety to the child, then, it is necessary either to boil, sterilize, or pasteurize the milk. Boiling it is the easiest method of all, and the one that can be carried out under any circumstances.

For a new-born infant the proportions are : One part of milk, two parts of water, which should have been boiled, and a little sugar—milk-sugar is the proper kind, but cane-sugar does well enough. This is given slightly warmed. A little lime-water should be added to each portion, so as to render it alkaline. If barley-water is used instead of plain water, it makes a better mixture. This mixture, as we have already seen, is weak in all its ingredients. To overcome that, cream mixtures are used, so as to increase the amount of fat, which is so essential. Instead of this, the following mixture may be used : Boiled milk, 1 tablespoonful ; cream, 1 to 2 teaspoonfuls ;

boiled water, or barley-water, 2 to 2½ tablespoonfuls; sugar, one small lump; lime-water, 1 teaspoonful. The lime-water should not be boiled, but should be added when the milk has cooled down. If the child is not satisfied, it should have more of the mixture in the same proportions. After the first month, the amount of milk and cream should be increased and the water gradually lessened.

Cream mixture, ready prepared, can be got from some of the dairies. It can be easily prepared at home. Take 1 pint good milk, and add an equal quantity of water, strain and put in a clean dish, with a tap or a small hole with a cork in it, near the bottom; let it stand for an hour in summer and two hours in winter; then draw off the lower half. What is left will contain the cream. It should be boiled, and before feeding you add a little lime-water and sugar. If it is found too rich, it should be diluted further.

What is known as *artificial human milk* is now being supplied by some of the large dairies. It can be made at home quite easily. Let the milk stand until the cream has risen, then skim the cream off. Divide the skim milk into two equal portions, and to one of these add sufficient rennet to curdle it. Strain the whey from the curd, then mix the whey, the skim milk, and the cream together. The curd is thrown away. This mixture is easily digested, as it only contains half as much curd as ordinary cow's milk, but it is not identical in quality with human milk, as there is too little proteid. It does not keep long, so should be freshly prepared daily.

There are different forms of *bottles* used for administering the food. The one most usually employed has a long tube, but it is a very bad form. It is most difficult to keep clean, and there is always a temptation to leave the child in its cot with the bottle by its side, with the result that it will greedily empty it, and then go on swallowing air until the stomach is overdistended, and a bad attack of colic will follow. The best form of bottle is one in which the teat is slipped on the end. It is easily kept clean, and the child must be held on the knee while it is taking its drink. The bottle should be tilted sufficiently to keep the teat full, and not to allow of air being swallowed, and, as soon as the drink is finished, the teat should be taken from the baby's mouth. The bottle should then be thoroughly washed and kept standing in a soda or boracic acid solution. At least two bottles are necessary. It is of the utmost importance to keep them perfectly clean. If the least quantity of sour milk is given to the child, fermentation will be set up in the stomach, and an attack of inflammation be brought on. In hot weather it requires very great caution to avoid this. A so-called "pacifier" should never be given to a child to keep it quiet.

Besides cow's milk there are many other forms of artificial food used, and some of them give excellent results. Many of them are purely vegetable, and for that reason they should never be used alone. Only those which are to be added to milk are to be used. They do admirably after the first few months. When a child has cut a number of its teeth, a certain amount of starchy food can be given to it once a day, such as boiled bread and milk, or finely made, well-boiled porridge. When it comes to be about a year old it may have porridge and milk in the morning, and at noon mashed potatoes and gravy, occasionally beef or chicken tea, soft-boiled egg, or milk pudding, and of course milk to drink, with some barley-water. For its afternoon meal, bread and milk, or bread and butter. At bed-time, milk and biscuit, or perhaps porridge again. After eighteen months of age it may have a little meat or fish, and a little cocoa may be added. Milk should enter largely into the diet of a child for the first six or seven years at least. There is nothing better than porridge and milk for the breakfast of a growing child. The food should be given at regular and stated intervals, and eating at odd times should not be allowed.

Fruit, such as the pulp of grapes, may be given to a year-old child, and a little later on ripe, cooked or uncooked, simple fruits are beneficial. Green or over-ripe fruit should never be given. As regards sweets, the fewer children have the better for them. Stimulants should never be given, unless in a time of illness.

APPENDIX

STATISTICS OF THIRTY YEARS' WORK (1869 TO 1898 INCLUSIVE) IN THE OUTDOOR AND INDOOR DEPARTMENTS OF THE GLASGOW MATERNITY HOSPITAL

The following statistics have been compiled from the Journals of the Glasgow Maternity Hospital. They represent the full-time and premature labours attended in the outdoor and indoor departments of the hospital for thirty years, from 1869 to 1898 inclusive. The abortions and miscarriages have not been included, only labours with viable children. Three periods of ten years are dealt with in each department. The thirty years' work of each department is combined in two tables, and finally the whole work is summed up in one table. The labours are classified according to their numbers from one to twenty, and the ages of the patients are divided into five-year periods beginning at fifteen and ending at fifty-five. The married and single have been kept separate. The fatal cases are tabulated in the small columns to the left of the others. I have had to omit perhaps 500 or 600 cases where the age or number of the confinement has not been noted, but none of these were fatal ones. The causes of death are recorded under two headings: (1) Causes primarily due to parturition, and (2) causes not primarily due to parturition. Under the first heading I have included the few cases in which no cause of death was given. Some of these probably belong to Class 2, but their number is so small that they do not much influence the final result.

The operative cases and the serious complications have also been tabulated. The fever cases and some of the septicæmia ones were transferred to the Fever Hospital. Through the kindness of Dr. Dick, a former Maternity resident, I have been able to trace nearly all the septic cases, especially those of the last ten years. The fatal ones have been included in the lists. The typhus and scarlet-fever cases I have not traced, but as they are diseases unconnected with parturition, their omission is of small consequence.

The records of the cases have, on the whole, been faithfully kept, but of course there are bound to be some errors. I have been most particular about the fatal ones, and they are the ones which would be sure to be recorded. As the entire work has been done by myself, I can speak with some confidence as to the tables being as nearly accurate as one can get them.

To discuss the cases properly an entire volume would be necessary; but as space is limited, I shall merely point out a few of the outstanding features, and leave the tables to speak for themselves.

The outdoor cases are the more valuable of the two, as the conditions under which the work is done more nearly approach those of ordinary private midwifery work than those of the indoor. The patients are attended at their own houses by nurses, students, and young graduates, who do their work under the supervision of the outdoor house surgeons. The abnormal cases are dealt with by the house surgeons and district accoucheurs, and exceptionally difficult cases are transferred to the hospital, or are dealt with at home by one of the chief physicians.

A study of the tables brings out some very interesting facts. We shall take the outdoor ones first.

	No. of Cases.	Fatal.	Approximate Proportion.
First decade - - -	8553	60	1 in 142
Second decade - -	12402	72	1 in 172
Third decade - - -	20156	56	1 in 360
	41111	188	1 in 218

This shows a remarkable fall in the death-rate.

If we take the deaths due primarily to parturition, we see a much more striking improvement.

	No. of Cases.	Fatal.	Approximate Proportion.
First decade - - -	8553	46	1 in 186
Second decade - -	12402	52	1 in 238
Third decade - - -	20156	39	1 in 517
	41111	137	1 in 300

Of these 137 deaths, 46 were due to septicæmia, viz.:

	No. of Cases.	Fatal.	Approximate Proportion.
First decade - - -	8553	18	1 in 475
Second decade - -	12402	14	1 in 886
Third decade - - -	20156	14	1 in 1440
	41111	46	1 in 894

This is a most gratifying result, because it has been frequently pointed out that puerperal septicæmia, throughout the country generally, is almost, if not quite, as fatal as it was before the introduction of antiseptics. In our next ten years I am convinced that there will be a much greater improvement.

If we consider the total cases (Table IV.), we find there were 41111 with 188 deaths (1 in 218); of these 137, or 73 per cent., were primarily due to parturition (1 in 300), and of these latter 46, or 25 per cent., were due to septicæmia (1 in 894). Taking the married and single separately, we find 37338 married with 164 deaths (1 in 227), and of those primarily due to parturition 118, or 72 per cent. (1 in 316). Of the 3773 single ones, 24 were fatal (1 in 157), and 19, or 79 per cent., primarily due to parturition (1 in 200). As one would expect, the death-rate among the single is considerably higher than among the married.

It would be interesting to study the death-rate according to the age and number of confinements, but we cannot go into that at present. I merely wish to point out that the rate is very high in primiparæ (1 in 145 among the married, and 1 in 137 among the single), and it then falls among the married until we reach the eleventh labour, when there is a very marked rise; the thirteenth comes next, and then the twelfth. Among the single, nineteen out of the twenty-four deaths occurred among the primiparæ.

We might take up the different causes of death and compare them during the different decades; but I shall only deal with two—viz., secondary post-partum hæmorrhage and rupture of the uterus. During the first decade, secondary post-partum hæmorrhage occurred seven times, with five deaths; during the second there were four cases, and during the third three, without any deaths. This clearly shows a decided improvement in the conducting of the third stage of labour, and also in the treatment of post-partum hæmorrhage. The use of the hot douche has undoubtedly saved more lives than the cold one. There is a marked improvement in the results of the treatment of primary post-partum hæmorrhage during the third decade when the hot douche was freely used. As regards rupture of the uterus, there were two in the first decade, and very probably a third one, which is entered as a death from shock. As the patient died a few minutes after version of a hydrocephalic child which forceps had failed to extract, I think rupture had likely occurred. In the second and third decades there were nine at least treated, to a finish, at their own homes. There was a case of spontaneous rupture in the third decade which was transferred to the hospital and is included among the indoor cases. All were fatal.

In considering the operative work, we learn that the forceps was applied nearly twice as frequently during the second and third decades as during the first. Craniotomy was done more frequently during the middle decade. The proportion of craniotomies is very small, considering the large amount of rickets present in Glasgow. The explanation of the small number during the last ten years is due to the fact that such cases are usually transferred indoor. Married women used to object to come in, as the hospital in the olden days had a very bad reputation. Happily that is now becoming a thing of the past. The proportion of outdoor operative cases, taking them all round, is not a very large one. When we come to consider the operative work done indoors, we shall find the very opposite to be the case.

TABLE I.—MARRIED (OUTDOOR), 1869-1878.

	15-19.		20-24.		25-29.		30-34.		35-39.		40-44.		45-49.		50-54.	55-59.	Died.	Lived.	Total.
1	2	332	6	716	1	167	3	41		18		5		1			12	1280	1292
2	1	59	1	704	1	293	2	100	1	29		6		1			6	1192	1198
3		6		338	2	488	1	167		40		7		1			3	1047	1050
4				131	1	440	3	241		95		19					4	926	930
5				36	2	301	2	292	2	101	1	21		2			7	753	760
6				11		191	2	297	2	153		37		3			4	692	696
7				2		76	1	247	1	182	1	45		3			3	555	558
8				1		26	1	147	1	142		64		5	1		2	386	388
9						14	1	87	2	159		62		8	1		3	331	334
10						3		38		93		61		3	1			199	199
11						2		15	3	48	2	65	1	6	2		6	138	144
12								10		24	1	36		11			1	81	82
13								3	1	12		22		1			1	38	39
14						1					1	7		1	2		1	11	12
15										1		5		1				7	7
16												1		1				2	2
17														1				1	1
	3	397	7	1939	7	2002	16	1685	13	1097	6	463	1	49	7		53	7639	7692

Causes of death among the Outdoor Cases from 1869 to 1878 :

I. Causes primarily due to parturition :

	Married.	Single.	Total.
1. Septicæmia - - - - -	16 (*a*)	2	18
2. Primary Post-partum Hæmorrhage	2 (*b*)	1	3
3. Secondary ,, .	5 (*c*)	0	5
4. Placenta Prævia - - -	3	0	3
5. Accidental Hæmorrhage - -	2	1	3
6. Eclampsia - - - -	5	1	6
7. Rupture of the Uterus - -	2	0	2
8. Shock - - - - -	3 (*d*)	1	4
9. Cause not stated - - -	2	0	2
	—40	—6	—46

(*a*) Two of these occurred after placenta prævia.
(*b*) One of these after placenta prævia.
(*c*) Two of these after placenta prævia, and one on sixth day after inversion of the uterus attended by a midwife. It was also a case of placenta prævia.
(*d*) One of these was a case of hydrocephalus, in which version was done after forceps failed. The uterus was probably ruptured.

II. Causes not primarily due to parturition :

	Married.	Single.	Total.
1. Pneumonia - - - -	4	0	4
2. Phthisis - - - - -	2	1	3
3. Bronchitis - - - -	3	0	3
4. Cardiac Disease - - -	1	0	1
5. Small-pox - - - -	1 (*a*)	0	1
6. Scarlet Fever - - -	1 (*b*)	0	1
7. Lingering Disease - - -	1	0	1
	—13	—1	—14

(*a*) Died on the second day after delivery. The child became fevered on the eighth day, and died the next day just as the rash appeared.
(*b*) Mother died on the fourth day. Result to child not mentioned.

TABLE I.—SINGLE (OUTDOOR), 1869-1878.

	15-19.		20-24.		25-29.		30-34.		35-39.	40-44.	45-49.	Died.	Lived.	Total.	Grand Total—M. and S.	
															Died.	Died and Lived.
1	1	258	3	210	1	52	1	22	3	1		6	546	552	18	1844
2		8	1	105		43		14	5			1	175	176	7	1374
3				23		26		6	5	1			61	61	3	1111
4				13		14		4	3				34	34	4	964
5				4		6		6	2	1			19	19	7	779
6						4		6	4		1		15	15	4	711
7								1	3				4	4	3	562
8															2	388
9															3	334
10																199
11															6	144
12															1	82
13															1	39
14															1	12
15																7
16																2
17																1
	1	266	4	355	1	145	1	59	25	3	1	7	854	861	60	8553

Operative Cases, Outdoor, 1869 to 1878 :

Forceps	188	1 in 45
Version	64	1 in 134
Craniotomy	4	1 in 2138

Complications.		Fatal.
Primary Post-partum Hæmorrhage	34	3
Secondary ,, ,,	7	5
Placenta Prævia	25	9
Accidental Hæmorrhage	29	3
Eclampsia	16	6
Rupture of the Uterus	2	2

Complications.		Fatal.
Inversion of the Uterus	3	1
Insanity	4	0
(*a*) Small-pox	2	1
Scarlet Fever	1	1
(*b*) Typhus ,,	2	(?)

(*a*) The result to the second case of small-pox is not stated. The child died shortly after birth.

(*b*) The two cases of typhus were removed to the fever hospital. Result not stated.

There were three cases of triplets : two in 1869 and one in 1871.

TABLE II.—MARRIED (OUTDOOR), 1879-1888.

	15-19.		20-24.		25-29.		30-34.		35-39.		40-44.		45-49.	50-54.	Died.	Lived.	Total.
1	3	496	9	975	2	193	1	42	1	19		6	2		16	1733	1749
2		96	2	1042	4	413	1	85		21		8			7	1665	1672
3		13	2	636	2	727	1	197		49		8			5	1630	1635
4		3	2	251	2	709		277		117		11	1		4	1369	1373
5				79	1	499		384		127	1	24	1		2	1114	1116
6				15	4	284		410	1	190		35	2		5	936	941
7				7		125	2	365		238	1	32		1	3	768	771
8				1		59	5	248	2	241	1	61	7	1	8	618	626
9				1		23		154	3	222		70	5		3	475	478
10						1		64	2	172	2	61	5		4	303	307
11						3		23	2	86		60	8		2	180	182
12						3		4		47	1	53	5		1	112	113
13						1		5	1	27		19	2		1	54	55
14										6		11	3	1		21	21
15										3		3	2			8	8
16										2		1	1			4	4
17												3				3	3
18										1						1	1
19										1			1			2	2
20													1			1	1
	3	608	15	3007	15	3040	10	2258	12	1569	6	466	46	3	61	10997	11058

Causes of death among the Outdoor Cases from 1879 to 1888:

I. Causes primarily due to parturition:

	Married.	Single.	Total.
1. Septicæmia	11 (*a*)	3	14
2. Primary Post-partum Hæmorrhage	9	0	9
3. Secondary ,, ,,	0	0	0
4. Placenta Prævia	8 (*b*)	0	8
5. Accidental Hæmorrhage	1 (*c*)	0	1
6. Eclampsia	4	5	9
7. Rupture of the Uterus	0	0	0
8. Shock	6	0	6
9. Embolism	2	1	3
10. Cause not stated	2	0	2
	—43	—9	—52

a) One of these occurred after placenta prævia, and one after accidental hæmorrhage.

(*b*) Three others died: one of septicæmia, one of bronchitis, one of pneumonia.

(*c*) One other died of septicæmia.

II. Causes not primarily due to parturition:

	Married.	Single.	Total.
1. Pneumonia	3	1	4
2. Phthisis	6	1	7
3. Bronchitis	3	0	3
4. Cardiac Disease	3	0	3
5. Lingering Disease	3	0	3
	—18	—2	—20

TABLE II.—SINGLE (OUTDOOR), 1879-1888.

	15-19.		20-24.		25-29.		30-34.	35-39.	40-44.	Died.	Lived.	Total.	Grand Total—M. and S.	
													Died.	Died and Lived.
1	5	417	4	441		62	11	8	1	9	940	949	25	2698
2		27	1	154	1	55	15	2		2	253	255	9	1927
3		2		20		36	14	3			75	75	5	1710
4				3		18	8	3	1		33	33	4	1406
5						7	5	1			13	13	2	1129
6						1	4	3			8	8	5	949
7							3				3	3	3	774
8							1	2			3	3	8	629
9							1	2			3	3	3	481
10							1				1	1	4	308
11								1			1	1	2	183
12													1	113
13													1	55
14														21
15														8
16														4
17														3
18														1
19														2
20														1
	5	446	5	618	1	179	63	25	2	11	1333	1344	72	12402

Operative Cases, Outdoor, 1879 to 1888:

Forceps	518	1 in 24
Version	116	1 in 107
Craniotomy	20	1 in 620

Complications.		Fatal.
Primary Post-partum Hæmorrhage	96	9
Secondary ,, ,,	4	0
Placenta Prævia	42	11
Accidental Hæmorrhage	47	2
Eclampsia	24	9
Rupture of the Uterus	0	0

Complications.		Fatal.
Inversion of Uterus	0	0
Insanity	4	0
Chorea	2	0
Cancer of Cervix	1	0

Three cases of septicæmia were sent to Belvidere.

Two of the cases of insanity were sent to an asylum.

The case with cancer of the cervix was delivered by craniotomy. She made a good recovery, and was afterwards operated on in the Royal Infirmary.

One patient menstruated during the whole pregnancy.

One patient had three mammæ; two on the left side.

TABLE III.—MARRIED (OUTDOOR), 1889-1898.

	15-19.		20-24.		25-29.		30-34.		35-39.		40-44.		45-49.		50-54.	Died.	Lived.	Total.
1	5	692	2	1211	2	301		78		23		5		1		9	2311	2320
2		179	2	1617	1	680		171		53		9			1	3	2710	2713
3		20	1	1051	3	1003	1	279		89		15				5	2457	2462
4		2		477		1218	1	482		131		18				1	2328	2329
5			1	120	4	999	1	656	1	206		26		3		7	2010	2017
6				24	1	575	3	802	1	302		48		3	1	5	1755	1760
7				7		250	3	739	3	384	1	67		5		7	1452	1459
8				3	1	95		528		480	1	91		4		2	1201	1203
9						28	1	287	2	433		109		2	1	3	860	863
10						11		144	1	309		142		13		1	619	620
11					1	3	1	45	1	196	2	138	1	6		6	388	394
12						3		12	1	98		98		10		1	221	222
13								8		56		53		1			118	118
14								4		22		31		6			63	63
15								2		6		16		1			25	25
16										3		5		2			10	10
17												3					3	3
18												5		1			6	6
19										1							1	1
	5	893	6	4510	13	5166	11	4237	10	2792	4	879	1	58	3	50	18538	18588

Causes of death among the Outdoor Cases from 1889 to 1898:

I. Causes primarily due to parturition:

	Married.	Single.	Total.
1. Septicæmia - - - - -	11 (*a*)	3	14
2. Primary Post-partum Hæmorrhage	5	0	5
3. Secondary ,, ,, -	0	0	0
4. Placenta Prævia - - - -	6	0	6
5. Accidental Hæmorrhage - -	6	0	6
6. Eclampsia - - - - -	5	0	5
7. Rupture of the Uterus - - -	0	0	0
8. Shock - - - - - -	1 (*b*)	0	1
9. Embolism - - - - -	0	1	1
10. Persistent Vomiting - - -	1	0	1
	35	4	39

(*a*) One of these was after post-partum hæmorrhage, and one after placenta prævia.

(*b*) After craniotomy.

II. Causes not primarily due to parturition:

	Married.	Single.	Total.
1. Pneumonia (*a*) - - - -	5	2	7
2. Phthisis - - - - -	3	0	3
3. Bronchitis - - - -	3	0	3
4. Cardiac Disease - - - -	2	0	2
5. Acute Gastritis - - - -	2	0	2
	—15	—2	—17

(*a*) One after eclampsia.

TABLE III.—SINGLE (OUTDOOR), 1889-1898.

	15-19.		20-24.		25-29.	30-34.	35-39.	40-44.	45-49.		Died.	Lived.	Total.	Grand Total—M. and S.	
														Died.	Died and Lived.
1	2	470	2	487	117	20	4			1	4	1099	1103	13	3423
2		26	1	174	73	28	3	1			1	305	306	4	3019
3				48	28	11	2					89	89	5	2551
4				12	14	9	2	1				38	38	1	2367
5					7	5	2					14	14	7	2031
6				1	2	2	2					7	7	5	1767
7						3	3	1				7	7	7	1466
8							2		1		1	2	3	3	1206
9						1						1	1	3	864
10														1	620
11														6	394
12														1	222
13															118
14															63
15															25
16															10
17															3
18															6
19															1
	2	496	3	722	241	79	20	3	1	1	6	1562	1568	56	20156

Operative Cases, Outdoor, 1889 to 1898:

Forceps	759	1 in 26
Version	129	1 in 156
Craniotomy	16	1 in 1260
Induction of Labour	3	1 in 6718

Complications.		Fatal.
Primary Post-partum Hæmorrhage	156	6
Secondary ,, ,,	3	0
Placenta Prævia	38	7
Accidental Hæmorrhage	72	6

Complications.		Fatal.
Eclampsia	25	6
Rupture of the Uterus	0	0
Inversion of the Uterus	0	0
Insanity	1	0
Chorea	0	0

In one case, aged twenty-eight, 4-para, the woman had never menstruated.

In one case the hymen persisted and had to be incised.

One of the cases of placenta prævia had twins.

Three patients were sent to Belvidere suffering from septicæmia. They all died, and are included among the deaths from that cause.

TABLE IV.—MARRIED (OUTDOOR), 1869-1898.

	15-19.		20-24.		25-29.		30-34.		35-39.		40-44.		45-49.		50-54.	55-59.	Died.	Lived.	Total.
1	10	1520	17	2902	5	661	4	161	1	60		16		4			37	5324	5361
2	1	334	5	3363	6	1386	3	356	1	103		23		1	1		16	5567	5583
3		39	3	2025	7	2218	3	643		178		30		1			13	5134	5147
4		5	2	859	3	2367	4	1000		343		48		1			9	4623	4632
5			1	235	7	1799	3	1332	3	434	2	71		6			16	3877	3893
6				50	5	1050	5	1509	4	645		120		8	1		14	3383	3397
7				16		451	6	1351	4	804	3	144		8	1		13	2775	2788
8				5	1	180	6	923	3	863	2	216		16	2		12	2205	2217
9				1		65	2	528	7	814		241		15	2		9	1666	1675
10						15		246	3	574	2	264		21	1		5	1121	1126
11					1	8	1	83	6	330	4	263	2	20	2		14	706	720
12						6		26	1	169	2	187		26			3	414	417
13						1		16	2	95	1	94		4			3	210	213
14						1		4		28		49		10	2	1		95	95
15								2		10		24		4				40	40
16										5		7		4				16	16
17												6		1				7	7
18										1		5		1				7	7
19										2				1				3	3
20														1				1	1
	11	1898	28	9456	35	10208	37	8180	35	5458	16	1808	2	153	12	1	164	37174	37338

Causes of death among the Outdoor Cases from 1869 to 1898 :

I. Causes primarily due to parturition :

	Married.	Single.	Total.
1. Septicæmia - - - - - -	38	8	46
2. Primary Post-partum Hæmorrhage	16	1	17
3. Secondary ,, ,, -	5	0	5
4. Placenta Prævia - - - -	17	0	17
5. Accidental Hæmorrhage - -	9	1	10
6. Eclampsia - - - - - -	14	6	20
7. Rupture of the Uterus - - -	2	0	2
8. Shock - - - - - - -	10	1	11
9. Embolism - - - - - -	2	2	4
10. Causes not stated - - - -	4	0	4
11. Persistent Vomiting - - -	1	0	1
	—118	19	—137

II. Causes not primarily due to parturition :

	Married.	Single.	Total.
1. Pneumonia - - - - - -	12	3	15
2. Phthisis - - - - - -	11	2	13
3. Bronchitis - - - - - -	9	0	9
4. Cardiac Disease - - - - -	6	0	6
5. Small-pox - - - - - -	1	0	1
6. Scarlet Fever - - - - - -	1	0	1
7 Lingering Disease - - - - -	4	0	4
8 Acute Gastritis - - - - -	2	0	2
	—46	—5	—51

TABLE IV.—SINGLE (OUTDOOR), 1869-1898.

	15-19.		20-24.		25-29.		30-34.		35-39.		40-44.		45-49.		Died.	Lived.	Total.	Grand Total—M. and S.	
																		Died.	Died and Lived.
1	8	1145	9	1138	1	231	1	53		15		2		1	19	2585	2604	56	7965
2		61	3	433	1	171		57		10		1			4	733	737	20	6320
3		2		91		90		31		10		1				225	225	13	5372
4				28		46		21		8		2				105	105	9	4737
5				4		20		16		5		1				46	46	16	3939
6				1		7		12		9				1		30	30	14	3427
7								7		6		1				14	14	13	2802
8								1		4			1		1	5	6	13	2223
9								2		2						4	4	9	1679
10								1								1	1	5	1127
11										1						1	1	14	721
12																		3	417
13																		3	213
14																			95
15																			40
16																			16
17																			7
18																			7
19																			3
20																			1
	8	1208	12	1695	2	565	1	201		70		8	1	2	24	3749	5773	188	41111

Operative Cases, Outdoor, 1869 to 1898:

Forceps - - - - - - -	1465	1 in 28
Version - - - - - - -	309	1 in 133
Craniotomy - - - - - -	40	1 in 1027
Induction of Labour - - - -	3	1 in 13704
Complications.		Fatal.
Primary Post-partum Hæmorrhage - -	286	18
Secondary ,, ,, - - -	14	5
Placenta Prævia - - - - -	105	27
Accidental Hæmorrhage - - - -	148	11

Complications.		Fatal.
Eclampsia - - - - - - -	65	21
Rupture of the Uterus - - - - -	2	2
Inversion of the Uterus - - - - -	3	1
Insanity - - - - - - - -	9	0
Small-pox - - - - - - - -	2	1
Scarlet Fever - - - - - - -	1	1
Typhus ,, - - - - - - -	2	(?)
Chorea - - - - - - - -	2	0
Cancer of the Cervix - - - - -	1	0

TABLE V.—MARRIED (INDOOR), 1869-1878.

	15-19.		20-24.		25-29.		30-34.		35-39.		40-44.		45-49.	50-54.	Died.	Lived.	Total.
1	1	25		62	1	22	1	10		2		1			3	122	125
2		6		96	1	73	2	24		10		2			3	211	214
3		2		30		62	2	28		10		3			2	135	137
4				11	1	41		26		11					1	89	90
5				3		28		23		8		1				63	63
6				2		9	1	27		12		3	2		1	55	56
7						8		17		12	1	5			1	42	43
8						2		9		15		6				32	32
9								5		20		4				29	29
10								1		2		2	1	1		9	9
11								1				3	1			5	5
12								1		2			1			4	4
13										1		1				2	2
14												1				1	1
15																	
16																	
17																	
18																	
19																	
20																	
	1	33		204	3	245	6	174		105	1	32	5	1	11	799	810

Causes of death among the Indoor Cases from 1869 to 1878:

I. Causes primarily due to parturition:

	Married.	Single.	Total.
1. Septicæmia	3 (a)	17	20
2. Primary Post-partum Hæmorrhage	1	1	2
3. Secondary ,, ,,	1	0	1
4. Placenta Prævia	2	0	2
5. Accidental Hæmorrhage	0	0	0
6. Eclampsia	0	4	4
7. Rupture of the Uterus	0	1 (b)	1
8. Shock	2	3	5
9. Embolism	0	0	0
10. Insanity	0	1	1
11. Cause not stated	0	4	4
	—9	—31	—40

(a) One of these was a case of malacosteon pelvis with a macerated fœtus. Craniotomy was done.
(b) Due to version after failure with forceps.

II. Causes not primarily due to parturition:

	Married.	Single.	Total.
1. Pneumonia	0	3	3
2. Phthisis	2	5	7
3. Bronchitis	0	0	0
4. Cardiac Disease	0	1	1
	—2	—9	—11

TABLE V.—SINGLE (INDOOR), 1869-1878.

	15-19.		20-24.		25-29.		30-34.		35-39.		40-44.		45-49.		Died.	Lived.	Total.	Grand Total—M. and S.	
																		Died.	Died and Lived.
1	4	347	17	615	1	216	2	49	2	6		2			26	1235	1261	29	1386
2	1	13	4	335	5	247	2	75		16					12	686	698	15	912
3				21	1	53		22		9		2			1	107	108	3	245
4				9		24		10		4						47	47	1	137
5						3		9		3						15	15		78
6						4	1	3							1	7	8	2	64
7						1		5		3		1				10	10	1	53
8								1				1				2	2		34
9										1						1	1		30
10																			9
11																			5
12																			4
13																			2
14																			1
15																			
16																			
17																			
18																			
19																			
20																			
	5	360	21	980	7	548	5	174	2	42		6			40	2110	2150	51	2960

Operativo Cases, Indoor, 1869 to 1878:

			Died.	
Forceps - - - -	68	1 in 44	12	1 in 6
Version - - - -	21	1 in 141	2	1 in 10
Craniotomy - - -	2	1 in 1480	1	1 in 2
Induction of Labour -	2	1 in 1480	0	
Cæsarian Section - -	0			
	—93	1 in 32		

Complications.		Fatal.
Primary Post-partum Hæmorrhage - -	20	2
Secondary „ „ - -	1	1

Complications.		Fatal.
Placenta Prævia - - - - - -	2	2
Accidental Hæmorrhage - - - - -	1	0
Eclampsia - - - - - - -	11	4
Rupture of the Uterus - - - - -	1	1
Insanity - - - - - - - -	7	1
Scarlet Fever - - - - - - -	3	1
Malacosteon - - - - - - -	1	1
Cancer of the Cervix - - - - -	1	0

TABLE VI.—MARRIED (INDOOR), 1879-1888.

	15-19.		20-24.		25-29.		30-34.		35-39.		40-44.		45-49.	50-54.	Died.	Lived.	Total.
1	1	39	1	76	2	25		6		3					4	149	153
2		8	1	111	2	46	1	12	1	8		1			5	186	191
3		1		47	2	63		26		9		2			2	148	150
4				10	3	53	2	30		7					5	100	105
5				3	1	21		25		8		2			1	59	60
6					1	4		21		13	1	2			2	40	42
7						11	2	17		7	1	2			3	37	40
8						2		12		16		4				34	34
9								7	1	7	1	5			2	19	21
10							1	6	1	7		2			2	15	17
11										7		1				8	8
12									1	2		2			1	4	5
13								1		1		1				3	3
14																	
15												1				1	1
	1	48	2	247	11	225	6	163	4	95	3	25			27	803	830

Causes of death among the Indoor Cases from 1879 to 1888:

I Primarily due to parturition:

	Married.	Single.	Total.
1. Septicæmia - - - - -	10	21	31
2. Primary Post-partum Hæmorrhage	1	0	1
3. Secondary ,, ,, -	1	1	2
4. Placenta Prævia - - - -	1	1	2
5. Accidental Hæmorrhage - -	0	0	0
6. Eclampsia - - - - - -	1	3	4
7. Rupture of the Uterus - - -	4	0	4
8. Shock - - - - - - -	3	3	6
9. Embolism - - - - - -	0	2	2
10. Insanity - - - - - -	0	0	0
	—21	—31	—52

II. Causes not primarily due to parturition:

	Married.	Single.	Total.
1. Pneumonia - - - - - -	3	1	4
2. Phthisis - - - - - -	0	0	0
3. Bronchitis - - - - - -	1	0	1
4. Cardiac Disease - - - - -	0	1	1
5. Nephritis - - - - - -	1	3	4
6. Cancer of the Cervix - - -	1	0	1
	—6	—5	—11

TABLE VI.—SINGLE (INDOOR), 1879-1888.

	15-19.		20-24.		25-29.		30-34.		35-39.		40-44.	45-49.	Died.	Lived.	Total.	Grand Total—M. and S.	
																Died.	Died and Lived.
1	6	399	14	683	1	165	7	30	2	8	2	2	30	1289	1319	34	1472
2		21	3	311	2	203		37		13	2		5	587	592	10	783
3				31	1	51		7		4			1	93	94	3	244
4				7		10		12		4				33	33	5	138
5				1		1		3		1				6	6	1	66
6						5		1		1	1			8	8	2	50
7								3						3	3	3	43
8						1		3		1				5	5		39
9										4				4	4	2	25
10										1				1	1	2	18
11																	8
12										1				1	1	1	6
13																	3
14																	
15										1				1	1		2
	6	420	17	1033	4	436	7	96	2	39	5	2	36	2031	2067	63	2897

Operative Cases, Indoor, 1879 to 1888:

			Died.	
Forceps - - - -	307	1 in 9	8	1 in 38
Version - - -	39	1 in 74	10	1 in 4
Craniotomy - - -	38	1 in 76	13	1 in 3
Induction of Labour -	10	1 in 296	2	1 in 5
Cæsarian Section - -	3	1 in 987	2	2 in 3
	—397	1 in 7		

Complications.		Fatal.
Primary Post-partum Hæmorrhage - -	37	1
Secondary ,, ,, - -	3	1
Placenta Prævia - - - - -	16	2
Accidental Hæmorrhage - - -	7	0

Complications.		Fatal.
Eclampsia - - - - - - -	16	4
Rupture of the Uterus - - - - -	4	4
Insanity - - - - - -	0	0
Scarlet Fever - - - - - -	1	0
Measles - - - - - - - -	3	0
Chorea - - - - - - - -	1	0
Cancer of the Cervix - - - - -	1	1

Two cases of septicæmia sent to Belvidere I have not been able to trace.

There was one case of triplets in 1887. Two of the children died and one lived.

The first Cæsarian section was done in 1879, and the second in 1881. They both died of sepsis. The third was done in 1888. Mother and child did well.

TABLE VII.—MARRIED (INDOOR), 1889-1898.

	15-19.		20-24.		25-29.		30-34.		35-39.		40-44.		45-49.		50-54.		Died.	Lived.	Total.
1	1	57	13	144	9	77	2	15	1	6	1	1					27	300	327
2		11	1	150	4	94		41	1	11		1					6	308	314
3		1	2	77	3	99	5	46		9		3					10	235	245
4			2	22	6	92		55	1	17							9	186	195
5				11	1	61		45	1	24		2					2	143	145
6				1		29	1	37		20		2					1	89	90
7				1	2	18	2	30		28	2	5		1			6	83	89
8					1	2		25		18		1					1	46	47
9						1		15		21		3						40	40
10								2		17	1	5					1	24	25
11						1		2	3	9	1	7					4	19	23
12										2		4		2				8	8
13										3		1		1			1	6	7
14							1	1		1	1	1		1			1	3	4
15										1		1						2	2
16												1						1	1
17										1								1	1
	1	69	18	406	26	474	11	314	7	188	6	38		5			69	1494	1563

Causes of death among the Indoor Cases from 1889 to 1898:

I. Primarily due to parturition:

	Married.	Single.	Total.
1. Septicæmia	28	16	44
2. Primary Post-partum Hæmorrhage	1	0	1
3. Secondary ,, ,,	0	0	0
4. Placenta Prævia	5	1	6
5. Accidental Hæmorrhage	1	0	1
6. Eclampsia	13	6	19
7. Rupture of the Uterus	7	1	8
8. Shock	1	2	3
9. Embolism	0	0	0
10. Insanity	0	1	1
11. Persistent Vomiting	3	0	3
	59	27	—86

II. Causes not primarily due to parturition:

	Married.	Single.	Total.
1. Pneumonia	0	0	0
2. Phthisis	0	0	0
3. Bronchitis	0	1	1
4. Cardiac Disease	2 (*a*)	0	2
5. Nephritis (Uræmia)	3	1	4
6. Pernicious Anæmia	2 (*b*)	0	2
7. Delirium Tremens	1	0	1
8. Exhaustion from Starvation	1	0	1
9. Enteric Fever	1	1	2
	—10	—3	—13

(*a*) Post-mortem Cæsarian section was performed in one of these cases. The child breathed faintly, but did not survive.

(*b*) Both of these died undelivered. Post-mortem Cæsarian section was done on one. The child showed no signs of life.

TABLE VII.—SINGLE (INDOOR). 1889-1898.

	15-19.		20 24.		25-29.		30-34.		35-39.		40-44.		45-49.	50-54.	Died.	Lived.	Total.	Grand Total—M. and S.	
																		Died.	Died and Lived.
1	9	471	10	886	6	258		67		13		2			25	1697	1722	52	2049
2		34	3	415		243		61		14		5			3	772	775	9	1089
3			1	58		66		28		4		4			1	160	161	11	406
4				6		35		24		1		1				67	67	9	262
5				2		5		8	1	2					1	17	18	3	163
6								6		4						10	10	1	100
7								1		2						3	3	6	92
8								2				1				3	3	1	50
9																			40
10																		1	25
11																		4	23
12																			8
13																		1	7
14																		1	4
15																			2
16																			1
17																			1
	9	505	14	1367	6	607		197	1	40		13			30	2729	2759	99	4322

Operative Cases, Indoor, 1889 to 1898 :

			Died.	
Forceps - - - -	650	1 in 7	7	1 in 93
Version - - - -	154	1 in 28	14	1 in 11
Craniotomy - - -	112	1 in 39	22	1 in 5
Induction of Labour -	90	1 in 48	5	1 in 18
Cæsarian Section - -	56	1 in 77	18	1 in 3
Post-mortem Section -	2	1 in 2161		
	—1064	1 in 4		

Complications.		Fatal.
Primary Post-partum Hæmorrhage - -	62	1
Secondary ,, ,, -	1	0
Placenta Prævia - - - - -	45	6
Accidental Hæmorrhage - - -	28	2
Eclampsia - - - - - - -	47	19
Rupture of the Uterus - - - -	8	8
Occlusion of the Os Uteri - - -	1	0
Insanity - - - - - -	7	1

Complications.		Fatal.
Scarlet Fever - - - - - - -	5	(?)
Measles - - - - - - - -	2	0
Chorea - - - - - - - -	2	0
Enteric Fever - - - - - -	3	2
Malacosteon - - - - - - -	1	0

The scarlet-fever cases were removed to the Fever Hospital. I have not been able to find out the results. The enteric cases were also removed. Two of them died in the Fever Hospital. Three of the placenta prævia cases were with twins.

Of the Cæsarian section cases eighteen died—all from septicæmia, with two exceptions, one from shock apparently, as no indication of septic infection was found post-mortem, and the other from suppression of urine. In the latter case the uterine and abdominal wounds were soundly healed.

Post-mortem Cæsarian section was performed twice once after death from pernicious anæmia, and once after death from cardiac disease. In the second instance the child breathed faintly, but did not live ; in the first it was dead.

TABLE VIII.—MARRIED (INDOOR), 1869-1898.

	15-19.		20 24.		25-29.		30-34.		35-39.		40-44.		45 49.	50-54.	55-59.	Died.	Lived.	Total.
1	3	121	14	282	12	124	3	31	1	11	1	2				34	571	605
2		25	2	357	7	213	3	77	2	29		4				14	705	719
3		4	2	154	5	224	7	100		28		8				14	518	532
4			2	43	10	186	2	111	1	35						13	375	390
5				17	2	110		93	1	40		5				3	265	268
6				3	1	42	2	85		45	1	7	2			4	184	188
7				1	2	37	4	64		47	4	12	1			10	162	172
8					1	6		46		49		11				1	112	113
9						1		27	1	48	1	12				2	88	90
10							1	11	1	26	1	9	1	1		3	48	51
11						1		3	3	16	1	11	1			4	32	36
12								1	1	6		6	3			1	16	17
13							1	2		5		3	1			1	11	12
14										1	1	2	1			1	4	5
15										1		2					3	3
16												1					1	1
17										1							1	1
	3	150	20	857	40	944	23	651	11	388	10	95	10	1		107	3096	3203

Causes of death among the Indoor Cases from 1869 to 1898:

I. Causes primarily due to parturition:

	Married.	Single.	Total.
1. Septicæmia	41	54	95
2. Primary Post-partum Hæmorrhage	3	1	4
3. Secondary ,, ,,	2	1	3
4. Placenta Prævia	8	2	10
5. Accidental Hæmorrhage	1	0	1
6. Eclampsia	14	13	27
7. Rupture of the Uterus	11	2	13
8. Shock	6	8	14
9. Embolism	0	2	1
10. Insanity	0	2	2
11. Persistent Vomiting	3	0	3
12. Causes not stated	0	4	4
	-89	-89	-178

II. Causes not primarily due to parturition:

	Married.	Single.	Total.
1. Pneumonia	3	4	7
2. Phthisis	2	5	7
3. Bronchitis	1	1	2
4. Cardiac Disease	2	2	4
5. Nephritis	4	4	8
6. Pernicious Anæmia	2	0	2
7. Delirium Tremens	1	0	1
8. Exhaustion from Starvation	1	0	1
9. Enteric Fever	1	1	2
10. Cancer of the Cervix	1	0	1
	—18	—19	—35

TABLE VIII.—SINGLE (INDOOR), 1869-1898.

	15-19.		20-24.		25-29.		30-34.		35-39.		40-44.	45-49.	Died.	Lived.	Total.	Grand Total—M. and S. Total.	Grand Total—M. and S. Died and Lived.
1	19	1217	41	2184	8	639	9	146	4	27	6	2	81	4221	4302	115	4907
2	1	68	10	1061	7	693	2	173		43	7		20	2045	2065	34	2784
3			1	110	2	170		57		17	6		3	360	363	17	895
4				22		69		46		9	1			147	147	15	537
5				3		9		20	1	6			1	38	39	4	307
6						9	1	10		5	1		1	25	26	5	214
7						1		9		5	1			16	16	10	188
8						1		6		1	2			10	10	1	123
9										5				5	5	2	95
10										1				1	1	3	52
11																4	36
12										1				1	1	1	18
13																1	12
14																1	5
15										1				1	1		4
16																	1
17																	1
	20	1285	52	3380	17	1591	12	467	5	121	24	2	106	6870	6976	213	10179

Operative Cases, Indoor, 1869 to 1898 :

			Died.	
Forceps - - - -	1025	1 in 10	27	1 in 38
Version - - - -	214	1 in 48	26	1 in 8
Craniotomy - - -	152	1 in 70	36	1 in 4
Induction of Labour -	90	1 in 113	7	1 in 13
Cæsarian Section - -	59	1 in 172	20	1 in 3
Post-mortem Section -	2	1 in 5089		
	--1554	1 in 7		

In considering the fatalities after operations, it must be borne in mind that not infrequently the death was not due to the operation. For instance, nearly all the eclampsia cases were delivered either by forceps, version, or craniotomy, and three of the fatal induction cases were done for uncontrollable vomiting.

Complications.		Fatal.
Primary Post-partum Hæmorrhage - -	119	1
Secondary ,, ,, - -	5	2
Placenta Prævia - - - - -	63	10
Accidental Hæmorrhage - - - -	36	2
Eclampsia - - - - - -	74	27
Rupture of the Uterus - - - -	13	13
Occlusion of the Os Uteri - - -	1	0
Insanity - - - - - - -	14	1
Scarlet Fever - - - - - - -	9	(?)
Measles - - - - - - - -	5	0
Chorea - - - - - - - -	3	0
Enteric Fever - - - - - - -	3	2
Malacosteon - - - - - - -	2	1
Cancer of the Cervix - - - - -	2	1

TABLE IX.—MARRIED (OUTDOOR AND INDOOR), 1869-1898.

	15-19.		20-24.		25-29.		30-34.		35-39.		40-44.		45-49.		50-54.		55-59.		Died.	Lived.	Total.
1	13	1641	31	3184	17	785	7	192	2	71	1	18		4					71	5895	5966
2	1	359	7	3720	13	1599	6	433	3	132		27		1		1			30	6272	6302
3		43	5	2179	12	2442	10	743		206		38		1					27	5652	5679
4		5	4	902	13	2553	6	1111	1	378		48		1					24	4998	5022
5			1	252	9	1909	3	1425	4	474	2	76		6					19	4142	4161
6				53	6	1092	7	1594	4	690	1	127		10		1			18	3567	3585
7				17	2	488	10	1415	4	851	7	156		9		1			23	2937	2960
8				5	2	186	6	969	3	912	2	227		16		2			13	2317	2330
9				1		66	2	555	8	862	1	253		15		2			11	1754	1765
10						15	1	257	4	600	3	273		22		2			8	1169	1177
11					1	9	1	86	9	346	5	274	2	21		2			18	738	756
12						6		27	2	175	2	193		29					4	430	434
13						1	1	18	2	100	1	97		5					4	221	225
14						1		4		29	1	51		11		2		1	1	99	100
15								2		11		26		4						43	43
16										5		8		4						17	17
17										1		6		1						8	8
18										1		5		1						7	7
19										2				1						3	3
20														1						1	1
	14	2048	48	10313	75	11152	60	8831	46	5846	26	1903	2	163		13		1	271	40270	40541

Causes of death among the Outdoor and Indoor Cases from 1869 to 1898 :

I. Causes primarily due to parturition :

	Married.	Single.	Total.
1. Septicæmia - - - -	79	62	141
2. Primary Post-partum Hæmorrhage - - - - -	19	2	21
3. Secondary Post-partum Hæmorrhage - - - - -	7	1	8
4. Placenta Prævia - - -	25	2	27
5. Accidental Hæmorrhage - -	10	1	11
6. Eclampsia - - - - -	28	19	47
7. Rupture of the Uterus - -	13	2	15
8. Shock - - - - -	16	9	25
9. Embolism - - - -	2	4	6
10. Insanity - - - - -	0	2	2
11. Persistent Vomiting - - -	4	0	4
12. Causes not stated - - -	4	4	8
	207	108	315

II. Causes not primarily due to parturition :

	Married.	Single.	Total.
1. Pneumonia - - - -	15	7	22
2. Phthisis - - - - -	13	7	20
3. Bronchitis - - - - -	10	1	11
4. Cardiac Disease - - - -	8	2	10
5. Small-pox - - - - -	1	0	1
6. Scarlet Fever - - - -	1	0	1
7. Lingering Disease - - -	4	0	4
8. Acute Gastritis - - - -	2	0	2
9. Nephritis - - - - -	4	4	8
10. Pernicious Anæmia - - -	2	0	2
11. Delirium Tremens - - -	1	0	1
12. Exhaustion from Starvation -	1	0	1
13. Enteric Fever - - - -	1	1	2
14. Cancer of the Cervix - -	1	0	1
	64	22	86

TABLE IX.—SINGLE (OUTDOOR AND INDOOR), 1869-1898.

	15-19.		20-24.		25-29.		30-34.		35-39.		40-44.		45-49.		50-54.		Died.	Lived.	Total.	Grand Total—M. and S.	
																				Died.	Died and Lived.
1	27	2362	50	3322	9	870	10	199	4	42		8		3			100	6806	6906	171	12872
2	1	129	13	1494	8	864	2	230		53		8					24	2778	2802	54	9104
3		2	1	201	2	260		88		27		7					3	585	588	30	6267
4				50		115		67		17		3						252	252	24	5274
5				7		29		36	1	11		1					1	84	85	20	4246
6				1		16	1	22		14		1		1			1	55	56	19	3641
7						1		16		11		2						30	30	23	2990
8						1		7		5		2	1				1	15	16	14	2346
9								2		7								9	9	11	1774
10								1		1								2	2	8	1179
11										1								1	1	18	757
12										1								1	1	4	435
13																				4	225
14																				1	100
15										1								1	1		44
16																					17
17																					8
18																					7
19																					3
20																					1
	28	2493	74	5075	19	2156	13	668	5	191		32	1	4			130	10619	10749	401	51290

Operative Cases, Outdoor and Indoor, 1869 to 1898:

Forceps	2490	1 in 21
Version	523	1 in 98
Craniotomy	192	1 in 267
Induction of Labour	93	1 in 537
Cæsarian Section	59	1 in 870
Post-mortem Section	2	1 in 25645

Complications.		Fatal.
Primary Post-partum Hæmorrhage	405	22
Secondary ,, ,,	19	7
Placenta Prævia	168	37
Accidental Hæmorrhage	184	13
Eclampsia	139	48

Complications.		Fatal.
Rupture of the Uterus	15	15
Occlusion of the Os Uteri	1	0
Inversion of the Uterus	3	1
Insanity	23	1
Small-pox	2	1
Scarlet Fever	10	1(?)
Typhus ,,	2	(?)
Enteric ,,	3	2
Measles	5	0
Cancer of the Cervix	3	1
Chorea	5	0
Malacosteon	2	1

The indoor cases are fewer in number, but the death-rate is exceedingly high. From the nature of the cases dealt with it could not be otherwise. I have already stated that a good many of the most difficult cases are brought in from the outdoor department. Besides these, we have many exceedingly bad cases sent in by private practitioners in Glasgow and its immediate neighbourhood, and also from the various towns in the West of Scotland. As a rule, these cases only reach us after they have been long in labour, and in many cases after repeated attempts have been made to deliver them. As illustrative of this, take the eight cases of ruptured uterus in the third decade. Six were sent to us in a hopeless condition; in fact, one died a few minutes after admission. Of the other two, one was a case of spontaneous rupture, already referred to as having occurred in the outdoor department, while the remaining one alone occurred in the hospital. This was a case of contracted pelvis delivered by antero-posterior forceps. The promontory perforated the back of the lower uterine segment. In the same way a good many cases of eclampsia and ante-partum hæmorrhage come to us practically moribund. By rights these deaths should not be entered, but it has always been the custom to do so. If we followed the method usually adopted in general hospitals of not counting such deaths, our death-rate would be much diminished. In the first decade the patients were treated in the old hospital which stood on the same site as the present one. It was pulled down in 1879, and the present one put in its place. The old building was, I believe, unsuitable in many ways. The present one, which was opened in January, 1881, falls far short of the requirements of the present day. The labour-rooms are far too small, there is no operating-theatre, and no isolation ward for septic cases. I believe the old building was condemned because of so many of the cases becoming septic. If stone and lime were at fault, the new building should have been free from this; but a study of the cases treated during 1881 shows the same series of high temperature, with occasional fatal cases of sepsis, as occurred before. This condition of matters continued more or less until, in 1896, five cases of sepsis were removed to the Fever Hospital in one week, and there were many cases of high temperatures in the hospital. Overcrowding was generally blamed, and efforts were made to restrict the numbers admitted. Every antiseptic precaution was adopted during labour, and it seemed quite evident to me when I took charge of the hospital in December, 1896, that the patients were being infected in the wards. Napkins to receive the lochial discharges were used over and over again. They were, of course, washed, and were supposed to be boiled. I had two of the supposed boiled napkins tested bacteriologically, and staphylococci were found in both. My suspicions were confirmed, and the explanation of the high temperatures made plain. A sterilizer was at once fitted up, and since then everything which comes in contact with the patients has been sterilized. Sterilized wool napkins are now used, and burned when soiled. The most rigid aseptic precautions are adopted during the labour and the puerperium. During, or immediately after, labour, douching is never done, except in operative cases, cases of post-partum hæmorrhage, cases with a septic vaginal discharge, and when there is a macerated fœtus. Vaginal examinations are made as seldom as possible, and only after the patient's external genitals have been thoroughly cleansed. The examiner's hands and forearms are rendered as aseptic as possible, and only lysol is used as a lubricant. All instruments are boiled immediately before being used. The result is that we now rarely have rises of temperature from septic absorption in the cases we have had to deal with from the first. If the case has been examined outside without the external genitals having been cleansed, we often find a slight rise. We have had septic cases, but during the last three and a half years we have only sent one septic case to the fever hospital, and she was septic on admission. Intra-uterine douching during the puerperium is hardly ever necessary. In 1896 it was being done almost daily. As regards overcrowding, during last year we treated more patients in the hospital than in any previous year, and this year shows a marked increase over last.

We shall now examine the indoor cases.

	No. of Cases.	Total Fatal.	Approximate Proportion.
First decade - - -	2960	51	1 in 58
Second decade - - -	2897	63	1 in 46
Third decade - - -	4322	99	1 in 44
	10179	213	1 in 48

This shows a marked rise in the death-rate.

If we take the deaths primarily due to parturition, we find—

	No. of Cases.	Fatal.	Approximate Proportion.
First decade - - -	2960	40	1 in 74
Second decade - - -	2897	52	1 in 56
Third decade - - -	4322	86	1 in 50
	10179	178	1 in 57

This still shows a steady rise.

Of these 178 deaths 95 were due to septicæmia, viz. :

	No. of Cases.	Fatal.	Approximate Proportion.
First decade - - -	2960	20	1 in 148
Second decade - - -	2897	31	1 in 93
Third decade - - -	4322	44	1 in 99
	10179	95	1 in 107

The proportion of deaths from sepsis, as compared to other deaths primarily due to parturition, is practically the same in the first and third decades—viz., 50 and 51 per cent.—but it is slightly greater in the second (60 per cent.). In the first decade the cases were treated in the old hospital, in the second, most of them were in the new building, and the remainder in a temporary hospital.

Taking the total cases, the entire death-rate is 1 in 48; from causes primarily due to parturition (84 per cent. of the total deaths), 1 in 57; and from sepsis (53 per cent. of those primarily due to parturition), 1 in 107.

In considering the outdoor cases we saw that the death-rate has fallen markedly, while in the indoor cases we now see the very opposite. At first sight this does not seem very satisfactory, but there is a very simple explanation. A glance at the number of operative cases and complications dealt with will at once show the cause of the high death-rate. During the different decades the following operations were done:

	First Decade.		Second Decade.		Third Decade.	
Forceps - - - - -	68	1 in 44	307	1 in 9	650	1 in 7
Version - - - - -	21	1 in 141	39	1 in 74	154	1 in 28
Craniotomy - - - - -	2	1 in 1480	38	1 in 76	112	1 in 39
Induction of labour - - -	2	1 in 1480	10	1 in 296	90	1 in 48
Cæsarian section - - -	...		3	1 in 987	56	1 in 77
Cæsarian section, post-mortem	...		...		2	1 in 2161
Total - - - - -	93	1 in 32	397	1 in 7	1064	1 in 4

In the same way, if we compare the complications dealt with, a single glance will show the enormous difference in the cases. Take the cases of ante-partum hæmorrhage in each decade. In the first decade there were two cases of placenta prævia (both fatal), and one case of accidental hæmorrhage. In the second, sixteen cases of placenta prævia (two fatal), and seven cases of accidental hæmorrhage in a smaller number of cases. In the third there were forty-five cases of placenta prævia (six fatal), and twenty-eight of accidental hæmorrhage (two fatal).

In the first decade the cases were mostly normal. In fact, the proportion of bad cases was much the same as in the outdoor department. During the last two decades more and more abnormal cases have been steadily coming to the hospital. The increase in the operative work has been enormous. The more frequent use of the forceps accounts for a good many of the operations. It goes without saying that the forceps is applied very much more frequently than formerly, and with the happiest results. No woman is now allowed to linger on in agony until she is exhausted. If with good pains the head is not making any progress after the second stage has lasted three hours in a multipara or four in a primipara, we make it a rule to deliver. A very large proportion of our forceps cases are high ones, with contracted pelves, and in many delivery is only possible in the Walcher position. That the early application of forceps, and therefore their more frequent use, is beneficial to the patients, is abundantly proved by the results in the different decades. In the first decade, of the 68 cases 12 died (1 in 6); in the second, of the 307 cases 8 died (1 in 38); and in the third, of the 650, 7 died (1 in 93). In the second and third decades some of these fatal forceps cases were really cases of ante-partum hæmorrhage and eclampsia, whereas in the first decade so few of these complications were dealt with that exceedingly few of the fatal forceps cases could have been of this nature. Sepsis, shock, and exhaustion were the causes of death in forceps cases in the first decade.

Versions and inductions of labour have also been much more frequent in the last two decades. Taking the major operations of craniotomy and Cæsarian section, we see a very great increase. It is very extraordinary that in the first decade only two craniotomies were necessary. One of these was fatal. Very few cases of contracted pelvis were dealt with.

Deformity of the pelvis from rickets is so very common at the present day that we are practically never without one or two cases in the hospital, and have sometimes had as many as eight. Within the last two or three years fully 10 per cent. of the cases have had contracted pelves, and by that I mean with a true conjugate of from 3¾ inches downwards. We have many others with very slight contractions. From the study of the records, it seems to me that rickets could not have been a very common disease among the infants of fifty years ago, but that after that it must have become much more common. At the present day we are dealing with the results of the disease of from twenty to thirty years ago. Sir Hector Cameron recently remarked to me that he was quite convinced that rickets was now on the decline in Glasgow. From a much more limited experience I had come to the same conclusion. Fifty years ago the city was not nearly so overcrowded, and I take it that the poor lived more on oatmeal, and, what is of the greatest consequence to the infants, they were brought up on the breast, and not on condensed skim milk or starchy trash as at the present day. Loch Katrine water is, of course, generally blamed, but unjustly. I have seen quite as bad cases of rickets in London as here, and yet the London water is just as hard as the Glasgow water is soft.

Fifty years ago sanitation, which is now doing so much in improving the public health, was in its infancy. In a few years, I imagine, the number of rickety pelves will begin to diminish, but at the present time we are dealing with the results of the disease when it was at its acme. The proportion of other complications is also very large. As I have already pointed out, many of these complicated cases are in a hopeless condition when admitted.

If we now compare the proportion of deaths among the married and single of the three decades, we find :

	Married.	Total Fatal.		Primarily due to Parturition.	
First decade - - -	810	11	1 in 73	9	1 in 90
Second decade - -	830	27	1 in 31	21	1 in 40
Third decade - - -	1563	69	1 in 23	59	1 in 27
Total - - -	3203	107	1 in 30	89	1 in 36

	Single.	Total Fatal.		Primarily due to Parturition.	
First decade	2150	40	1 in 54	31	1 in 69
Second decade	2067	36	1 in 57	31	1 in 67
Third decade	2759	30	1 in 92	27	1 in 102
Total	6986	106	1 in 66	89	1 in 78

It is rather curious that, except in the first decade, the death-rate among the married is much the higher. Taking the total in the three decades, the death-rate among the married is fully double that among the single. This is contrary to what one would expect, but the explanation will be found in the fact that the great majority of patients sent in by practitioners are married. They are all very difficult cases, and some of them hopeless.

Many interesting details might be brought out by comparing the results of treatment of the complicated cases in each decade, but space will not permit me to do this.

In Table IX. we have the whole of the cases combined.

		Total Fatal.		Primarily due to Parturition.	
Married	40541	271	1 in 150	207	1 in 196
Single	10749	130	1 in 83	108	1 in 100
Total	51290	401	1 in 128	315	1 in 164

The death-rate among the single cases all over is thus seen to be much higher than among the married. The death-rate among the primiparæ, especially among the single ones, is much higher than with subsequent births until we reach the eleventh among the married, when it reaches its highest point (1 in 42).

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